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A

TREATISE

ON

NEURALGIC DISEASES,

DEPENDENT UPON

IRRITATION OF THE SPINAL MARROW AND GANGLIA OF THE SYMPATHETIC NERVE.

BY

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LONDON:

PRINTED FOR S. HIGHLEY, 174, FLEET STREET;

AND WEBB STREET, MAZE POND, BOROUGH.

1829.

GUNNELL AND SHEARMAN, 13, SALISBURY SQUARE.

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INTRODUCTION.

The term Neuralgia, which was originally employed to designate certain affections of nerves attended with severe pain, has of late, with great propriety, been extended, from its original and literal signification, to many other morbid affections of nerves, which are not characterized by pain, but by some other perverted state of their functions.

Neuralgia includes within its range a great variety of diseases, presenting an endless diversity both in their symptoms and in the parts where they are seated. That such variety should exist, ceases to excite surprise, when we consider how varied are the functions of the different nerves, and how diversified the tissues and organs to which they are distributed.

To the attentive observer of disease, neuralgic affections, under this more extended signification, must repeatedly present themselves. The skin, for instance, may be the seat of every degree of exalted or diminished sensibility, from the slightest uneasiness to the most acute suffering, and from the most trivial diminution of sensibility to complete obliteration of feeling—symptoms not dependent upon disease affecting the different tissues of the part, but solely referable to a morbid condition of the sentient nerves. The voluntary muscles may, in like manner, indicate, in a variety of ways, a morbid con-

dition of the nerves with which they are supplied. They may be affected with weakness, spasms, tremors, or a variety of other disordered states included within the two extremes of convulsion and paralysis. The involuntary muscles may have the harmony of their actions interrupted, from a morbid condition of their nerves; the heart may be affected with palpitations; the vermicular motion of the stomach, or the peristaltic action of the intestines, may be subject to irregularity. The sensibility of the internal organs may likewise be affected, the heart, the stomach, the intestines being the seat of pain, referable to their nerves, and independent of inflammation, or any alteration of structure. The secretions may also undergo alterations, both in quantity and in quality, from a perverted agency of the nerves upon which they depend. Such is a very imperfect recital of the various morbid affections which may be included under the term Neuralgia, and so frequent is their occurrence, that they must be familiar to every practitioner. They are, however, often perplexing in their treatment, and not unfrequently exhaust the patience of the afflicted sufferer, and also of the medical attendant.

The difficulty and embarrassment which have attended the diagnosis and treatment of these affections, I am inclined to believe, has principally arisen from mistaken views of their pathology. They have too often been regarded as actual diseases of those nervous filaments which are the immediate seat of the neuralgia, instead of being considered as symptomatic of disease in the larger nervous masses from which those filaments are derived; hence *the treatment has too frequently been ineffectually applied to the seat of neuralgia, instead of being directed to the more remote and less obvious seat of disease.*

It is now pretty generally admitted as a pathological axiom, that disease of the larger nervous masses, as the brain and spinal marrow, is not so much evinced by phenomena in the immediate seat of disease, as in those more remote parts to which the nerves arising from the diseased portion are distributed. In the more severe forms of disease, this principle is readily admitted and recognized. When, for instance, one half of the body shall have lost its sensibility, and the corresponding muscles their power of action, the skin and the muscles are not regarded as the seat of disease, but the *brain* is immediately referred to. In the slighter forms of disease of the brain and spinal marrow, such as do not completely obliterate, but merely impair or pervert the functions of the nerves—such as do not paralyze the sentient and muscular powers of the part, but produce weakness, tremors, spasms, &c. in the muscular system, and numbness, pricklings, pains, and other morbid feelings in the nerves of sensation, this important principle, which as strictly obtains as in the former instance, is too often entirely overlooked; and a numerous class of complaints, of very frequent occurrence, are regarded as nervous or spasmodic diseases of the part affected, instead of being considered as actual diseases of that portion of the brain or spinal marrow from which the nerves of the part are derived.

The same pathological principle is, I believe, equally applicable to the sympathetic system of nerves; and although it may be difficult to establish this opinion by actual experiment, yet I think it may be rested upon a well-grounded analogy, which will justify us in regarding the nervous masses of the ganglionic system as bearing the same relation to the nerves derived from them,

as the large nervous masses of the cerebro-spinal system bear to their respective nerves. Hence, many nervous affections of the viscera ought not to be considered as diseases of the viscera themselves, but as symptomatic of disease in those particular ganglia whence their nerves are derived.

Influenced by such considerations, I have, for a few years, been in the habit of treating many of these nervous affections as diseases of some portion of the spinal marrow or ganglia; and have been still further confirmed in my opinion, by the frequent and almost uniform coexistence of tenderness on pressing some portion of the vertebral column, and the circumstance of the tender portion of the spine being in the particular situation where the nerves of the affected part originate.

During the early part of the year 1828, I was engaged in preparing for publication some observations on this subject, and had proceeded so far as to have arranged this treatise almost in its present form, when I was much gratified by the appearance of an interesting Essay, by Dr. Brown, on "Irritation of the Spinal Nerves."

About a year after the publication of Dr. Brown's Essay, a valuable communication on "Some forms of Cerebral and Spinal Irritation," by Dr. Darwall, of Birmingham, was published in the Midland Medical Reporter; and I have lately seen a short exposition of similar views, by Mr. Player, of Malmsbury, in a letter addressed to the editor of the Quarterly Journal of Science, as early as the year 1821.

I shall take the liberty of quoting largely from these authors, being glad to avail myself of their concurrent testimony in corroboration of the opinions which I have now to advance. On the appearance of Dr. Brown's Essay,

I at first relinquished the idea of publishing, as another had taken precedence of me in a somewhat similar course of observations. Having, however, at my leisure moments, taken into the fullest consideration what has been thus presented to the public, and being daily more convinced of the importance of the subject, I feel justified in attempting to reduce the facts which my own experience has afforded, into some definite form, and in deducing such practical conclusions as the phenomena of the various diseases dependent upon the causes adverted to, seem to warrant.

Mr. R. P. Player,* in his letter to the editor, "On Irritation of the Spinal Nerves," dated December 10, 1821, makes the following remarks:—"I take the liberty to submit to your notice a pathological fact, which has not, to the best of my knowledge, been generally remarked, and attention to which, as far as my own experience goes, promises some diminution of those difficulties with which the healing art has to contend. Most medical practitioners who have attended to the subject of spinal disease, must have observed that its symptoms frequently resemble various and dissimilar maladies, and that commonly the function of every organ is impaired whose nerves originate near the seat of the disorder. The occurrence of pain in *distant parts* forcibly attracted my attention, and induced frequent examination of the spinal column; and after some years' attention, I considered myself enabled to state, that in a great number of diseases, morbid symptoms may be discovered about the origins of the nerves which proceed to the affected parts, or of those spinal branches

* Quarterly Journal of Science, vol. xii. p. 428.

which unite with them; and that if the spine be examined, more or less pain will commonly be felt by the patient on the application of pressure about or between those vertebræ from which such nerves emerge.

"This spinal affection may, perhaps, be considered as the *consequence* of diseases, but of its existence at their commencement any one may satisfy himself; and this circumstance, combined with the success which has attended the employment of topical applications to the tender parts about the vertebræ, appears to indicate that the *cause may* exist there. Prejudice sometimes operates against the idea of connexions so remote; but in many instances patients are surprised at the discovery of tenderness in a part, of whose implication in disease they had not the least suspicion."

Dr. Brown* proposes, in his Essay, to offer a few observations on the symptoms and treatment of some diseases of the spine, which he considers to be by no means of rare occurrence, but which appear to be occasionally overlooked or neglected. "I allude (says Dr. B.) chiefly to those morbid affections of the spinal nerves so often met with in young females, and occasionally also, although much less frequently, in women of more advanced life, and in males.

"In most instances, certainly, this irritated state of the nerves is not entitled to the name of a serious disease, since the symptoms are not acute, and since they are easily removed or prevented; but when it is allowed

* On Irritation of the Spinal Nerves, by Thomas Brown, M. D., Senior Physician to the Royal Infirmary of Glasgow. *Glasgow Medical Journal, May*, 1828.

Dr. Brown adds this note:—"Five years since, viz. in January, 1823, the following essay, nearly, was read to the Medical Society of this city."

to remain for any considerable length of time, it often produces nervous complaints and general bad health; and, of course, it becomes infinitely more unmanageable.

"I find some difficulty in giving a name to this disease, but as it consists, perhaps, in a state of increased irritability in some of the spinal nerves, we may name it *spinal irritation.*"

The following case is related in illustration. "Miss C. æt. 17, (Sept. 1822) of a robust make, and apparently in good health, for more than a year has complained of pain situated below the left mamma. This has been fixed to one spot for nearly the whole time. It is a gnawing bruized feeling, increased materially by fatigue of any kind, and, after fatigue, it is attended with restlessness. It is relieved by reclining in the horizontal posture. It is not sore to the touch. The complaint has been treated by a surgeon in the country as rheumatism. She has been bled and blistered for it without any good effect, and at last it has occasioned so much anxiety in the minds of her relations, that she is brought to Glasgow, from a considerable distance, for the benefit of farther medical advice. On examining the spine, it is found to be perfectly of the natural shape and appearance, but when pressure is made on it, about the seventh or eighth dorsal vertebra, she complains of a considerable feeling of tenderness, amounting even to pain; and she finds that the uneasy sensation shoots forward exactly to the affected part of the breast. She had not paid any attention to this affected part of the spine, indeed she had not any idea that there was any thing faulty there, till her attention was called to it by the examination."

"When the affection of the spinal nerves is situated

about the middle of the lumbar vertebræ, it is apt to occasion severe pain in some part of the abdomen. I have seen it of a spasmodic nature, attended with flatulency, and occupying apparently the arch of the colon; and in one case, it seemed to be fixed in the caput coli. In these cases the severity of the complaint may appear to call for powerful evacuations, from the apprehension that inflammation exists; whereas, if the attention be directed to the share which nervous irritation from the spine has in increasing the acuteness of the pain, very active depletion will not appear necessary."

Dr. Brown thus divides these affections of the spinal nerves into two classes:—

"1. Those in which there is merely a morbid sensibility of a single nerve.

"2. Those in which there is a more general and constitutional irritability, in which the irritation is apt to affect different parts of the spine in succession, and to occasion a whole train of singular symptoms."

"Occasionally, disorder of the stomach and bowels is joined to this affection of the spinal nerves, and appears to arise from it, since it yields if the irritation of the spine is removed, and returns whenever this irritation is renewed."

"There is no part more frequently pained from nervous irritation, than the pericranium or scalp. The pain is often acute, and if we examine the parts minutely, we find that it shoots along the various nerves which are ramified over this tendinous membrane. If we press immediately behind the mastoid process, the pain passes upwards along the cervical nerve which takes that direction, and ramifies even as far forwards as the forehead."

Dr. Brown proceeds to comment at considerable length on the nature of these affections, and several interesting cases and observations are recorded.

A short time after the publication of Dr. Brown's Essay, a well marked case of spinal neuralgia came under the notice of Mr. Allan, which is thus related by him in the Glasgow Medical Journal. "Mary Durand, a single woman, æt. 24, applied to me on the 25th of June last for relief, complaining of pain in the left side, under the mamma, not in the gland. The pain was much aggravated by pressing with the fingers against the ribs, but sometimes, she said, it extended down the side, as far as the crest of the ilium. It was accompanied with pain at the top and towards the back part of the left shoulder, which she described as a sensation of burning, not interfering with the movements of the joint, but so tender to the touch was the part, that she could not rest on that side in bed, and always awoke in severe pain, if she happened to turn upon it." "Having perused Dr. Brown's paper on irritation of the spinal nerves, I was led to examine her spine, when I found that there were three or four of the middle dorsal vertebræ, the most moderate pressure upon which gave her considerable pain in the part, and increased that in her side. She had never previously felt pain in that part of her back, although the tenderness was too unequivocal, and too distinctly limited in extent, to leave any doubt as to its reality."

Dr. Darwall,* in the interesting essay already alluded

* Observations upon some forms of Spinal and Cerebral Irritation. By John Darwall, M.D. *Midland Medical and Surgical Reporter, May*, 1839.

to, after adverting to the recent discoveries relative to the functions of the nerves, proceeds to remark, "If however, the nervous system is more or less connected with every function of the animal body; if the circulation of the blood, the phenomena of respiration, and the operations of intellect, cannot be carried on without its intervention, the manner in which it is disregarded, cannot but be a most important defect. It has perhaps in great measure, arisen from always contemplating the brain as acted upon by the circulation, and never reversing the order of review."

Before entering more particularly into the consideration of the affections he is about to describe, Dr. Darwall considers the following circumstance ought to be referred to, "That disorders attacking the origins of nerves, or their attachment to the central mass, whether this be the brain or spinal chord, always disturb the functions of the organs to which such nerves are destined." The author then relates cases in which palpitations of the heart formed the prominent symptom, which were relieved by the application of blisters to the spine, after the usual remedies had failed, and in one case, after leeches had been applied to the region of the heart without benefit.

The following is the description given by Dr. Darwall of a form, in which cerebral and spinal irritation is frequently exhibited, particularly in young females. "It is attended by severe and constant pain in one or both hypochondria, extending to the shoulder and arm of the affected side, not always aggravated by pressure, and ceasing immediately upon or in a short time after lying down. It is this pain of which the patients generally complain, and it frequently endures for several

years. It is generally attended with much constitutional disturbance. There is headache, with great heat in the external surface of the head, severe throbbing of the temples, and pain in the nape of the neck. The temper is capricious, and the spirits very variable; and at the catamenial periods, the depression in many cases is excessive. The tongue, after some time, is furred, and at the back part greatly tuberculated. The stomach suffers under the various forms of dyspepsia, gastrodynia, flatulence, pyrosis, &c.; the bowels are in many instances much distended, and there is continual clangor intestinorum. Palpitation of the heart, more or less, is present, and often dyspnœa attends. The most common disturbance, however, is in the uterine function, and I have scarcely seen an instance in which this has not occurred. Most commonly there is menorrhagia; in some few cases the catamenia are diminished, or they are completely suppressed. But whether they are increased or diminished, leucorrhæa almost invariably attends, and is generally more or less profuse, in proportion to the duration of the general disorder. When the catamenia are profuse, they are usually, in the earlier part of the period, dark-coloured and grumous, and are accompanied with severe pain. The urine for the most part deposits a light-coloured sediment, and varies much in quantity, being occasionally very copious and limpid. The bowels are constipated, and yet no great relief is obtained by purging."

Other circumstances attending these affections are also noticed as "pain on the side in the course of the descending colon;" "difficulty of breathing, which is sometimes so great as to induce great fear of organic mischief having taken place in the lungs, especially

when, as indeed is generally the case, it is attended by frequent cough. The stethoscope, in these cases, is a great assistant in the diagnosis; the respiratory murmur is heard in every part of the chest, and is even puerile; indeed, this heightening of the respiratory murmur is very characteristic of the disorder in question."

It is, however, impossible for me to do justice to Dr. Darwall by quotation. To be fully appreciated, his essay must be read entire. I would also recommend to those who may feel interested in the subject, a careful perusal of the essay by Dr. Brown, which contains many interesting observations and facts.

From the various testimonies which have now been offered, it is evident that numerous disorders are dependent upon some morbid affection of the large nervous masses which give origin to the nerves of the affected parts. I shall, therefore, proceed to describe, according to my own opportunities for observation, various morbid phenomena exhibited by the spinal nerves, under the head of "Irritation of the Spinal Marrow," and several affections of the organs which derive their nerves from the sympathetic system, under "Irritation of the Ganglia of the Sympathetic."

I shall defer any pathological discussion of these diseases, until the phenomena, by which they are characterized, have been described.

IRRITATION

OF

THE SPINAL MARROW.

The symptoms of this affection consist in an infinite variety of morbid function of the nerves of sensation and volition which have their origin in the spinal marrow, and the parts in which these morbid functions are exhibited, of course, bear reference to the distribution of the spinal nerves.

The morbid states of sensation include every variety, from the slightest deviation from the healthy sensibility of any part to the most painful neuralgic affections on the one hand, and to complete numbness or loss of feeling on the other; including pains which may be fixed or fugitive, or darting in the direction of the nerves, prickling and tingling sensations, a sense of creeping in the skin, of cold water trickling over it, and numerous other states of perverted sensation, of which words are inadequate to convey a description. In the muscular system we find weakness or loss of power, tremors, spasms or cramps, and sometimes a tendency to rigidity.

These symptoms sometimes exist in so slight a degree, that the patient considers them unworthy of notice, and only admits their existence when particular inquiry is made respecting them; the only complaint which he

makes, being of an unaccountable sense of weakness and inability of exertion. In other cases the tremors have excited alarm; sometimes the neuralgic pain in the scalp, or the fixed pain in the muscles, particularly when it occurs in the intercostal muscles, have suggested the idea of serious disease in the brain or in the lungs; and when the pain is seated in the muscles of the abdomen, a fear that some organic disease of the abdominal viscera has taken place, harasses the mind of the patient. The muscular weakness, in some cases tending to paralysis, often suggests the fear of apoplexy, or paralysis from cerebral disease.

The affection is often of very protracted duration, undergoing alternate variations from the sanative powers of the constitution, and the different exciting causes of disease. There are many individuals in whom the complaint has existed, in varying degrees of intensity, for a series of years, without its real nature having been suspected; the patients and their medical attendants having regarded it throughout as a rheumatic or a nervous affection.

Many individuals, as young females and mothers of families, whose domestic duties require the complete exertion of their energies, are often unjustly accused of indolence, when labouring under the state of muscular debility to which I have alluded. They have felt an unconquerable disinclination to exertion, and a desire for sedentary pursuits, without even themselves being aware of the cause of this inertness.

In this complaint, tenderness in the portion of the vertebral column, which corresponds to the origin of the affected nerves, is generally in a striking and unequivocal manner evinced by pressure. In some in-

stances the tenderness is so great that even slight pressure can scarcely be borne, and will often cause pain to strike from the spine to the seat of spasm or neuralgia.

This affection of the spinal marrow occasionally exists throughout its whole extent; more frequently, however, it is confined to some particular portion, and occasionally is seated in different and remote portions at the same time; the particular symptoms, and the tenderness on pressure indicating the affected part.

The symptoms, of course, vary considerably, according to the particular part of the spine which is affected, and bear reference to the distribution of the different spinal nerves.

When the upper cervical portion of the spinal marrow is diseased, we frequently find neuralgic affections of the scalp; the pain strikes in various directions over the posterior and lateral parts of the head; sometimes the twigs in the neighbourhood of the ear, sometimes those which ascend over the occiput to the superior part of the scalp, are more particularly the seat of the complaint; the nervous twigs distributed to the integuments of the neck, are occasionally affected, the pain darting across the neck to the edge of the lower jaw, and sometimes encroaching a little upon the face.* These neuralgic diseases frequently assume an intermittent form, the paroxysms generally occurring in the evening. A stiff neck, or impaired action of the muscles moving the head, frequently attend the affection of the upper cer-

* Vertigo frequently attends this neuralgia of the scalp, and it is sometimes accompanied with tinnitus aurium. These symptoms, however, are, I think, more properly attributable to a concomitant affection of the neighbouring nerves of the sympathetic system. Violent throbbing of the temples, and increased heat of the scalp, often attend the paroxysm.

vical portion of the spinal marrow ; and occasionally the voice is completely lost or suffers alteration, and the act of speaking is attended with pain or difficulty.*

Irritation of the lower cervical portion of the spinal marrow gives rise to a morbid state of the nerves of the upper extremities, shoulders, and integuments at the upper part of the thorax. Pains are felt in various parts of the arm, shoulder, and breast; sometimes the pain takes the course of the anterior thoracic branches of the brachial plexus, occasionally the pain is fixed at some point near the clavicle scapula or shoulder-joint, at the insertion of the deltoid, or near the elbow, or shoots along the course of some of the cutaneous nerves. Frequently one or both of the mammæ become exquisitely sensible and painful on pressure, and some degree of swelling occasionally takes place in the breast, attended with a knotty and irregular feel, when the neuralgic pains have existed a considerable time in that part. Prickling and numbness, tingling and creeping sensations are often felt in the upper extremities; and also a sensation of cold water trickling over the surface. On rubbing the hand over the part affected, a soreness is frequently felt, which is described as not merely situated in the integuments, but also in the more deep-seated parts. In the muscular system are observed most frequently a weakness of the upper extremities, sometimes referred particularly to the wrists, tremors and unsteadiness of the hands ; also cramps and spasms of various degrees of intensity. Occasionally there is an inability to perform complete extension of the elbows, the arm appearing restrained by the tendon

* Difficulty of speaking and swallowing frequently depends, according to Portal, on "engorgement" in the cervical portion of the spinal marrow.

of the biceps; pain and tightness being produced in this part when extension is attempted beyond a certain point. As far as I have observed, the pains and other morbid feelings in the upper extremities and chest, are felt more frequently and more severely on the left than on the right side.

Females of sedentary habits appear particularly subject to these affections of the upper extremities, and it is not uncommon for them to complain of being scarcely able to feel the needle when it is held in their fingers, and that their needle or their work frequently drops from their hands.

When the upper dorsal portion is affected, in addition to various morbid sensations similar to those in the extremities, there is often a fixed pain in some part of the intercostal muscles, to which the name pleurodynia has been assigned; and when this pain has existed a long time, there is tenderness on pressing the part. When the lower dorsal half of the spinal marrow is the seat of this irritation, or subacute inflammation, the pleurodynia, when it exists, is felt in the lower intercostal muscles; frequently there is also a sensation of a cord tied round the waist; an oppressive sense of tightness across the epigastrium and lower sternal region; and soreness along the cartilages of the lower ribs, or in the course of insertion of the diaphragm. Various pains, fixed and fugitive, are also felt in the parietes of the abdomen, throughout any part of the abdominal and lumbar muscles; the pain is frequently fixed in some portion of the rectus muscle, and not unfrequently in the oblique muscles or transversalis, a little above the crest of the ilium, particularly when the origin of two or three of the lowest dorsal nerves is diseased.

The affection of the lumbar and sacral portion of the spinal cord often produces a sensation of soreness in the scrotum and neighbouring integuments, and the lower extremities become the seat of various morbid sensations, spasms, tremors, &c., for the most part resembling those which have been described as occurring in the upper limbs. The patients also complain of a sense of insecurity or instability in walking; their knees totter, and feel scarcely able to support the weight of the body.

In some cases very considerable relief is found from recumbency, the pain frequently being diminished as soon as the patient retires to bed, independently of any paroxysmal remission.

This irritation, or subacute inflammatory state of the spinal marrow is not necessarily connected with any deformity of the spine, or disease in the vertebræ. It may co-exist with these as well as with any other diseases, but it so repeatedly occurs without them, that they cannot be regarded as dependant upon each other. Where, however, inflammation and ulceration of the vertebræ or intervertebral cartilages exist, it is probable they may predispose to, and, in some instances, act as an exciting cause of an inflammatory state of the nervous structures which they contain; for we not unfrequently find inflammatory affections of the vertebræ in conjunction with symptoms of irritation of the spinal marrow. But these two affections, although co-existing, bear no regular relation to each other; and, during the progress of the vertebral disease, the affection of the nervous structures is subject to great changes and fluctuations. The local remedies employed for arresting the disease in the bones, often alleviate the affection of the spinal marrow at the very commencement of

the treatment, long before the vertebral disease is suspended; but as the neighbouring inflammation in the bones appears to predispose or excite the nervous mass which they contain, to disease, relapses of the nervous affections are repeatedly occurring during the whole course of the complaint.

The affections of the spine, termed lateral curvature and excurvation, appear to have no necessary connexion with the disease which I have been describing; and the proportion of cases in which they are found united, is so small, that lateral curvature can scarcely be considered even as predisposing to this disease. The most extreme degrees of deformity frequently are observed without any affection of the nerves; and when lateral curvature does occasionally co-exist, local antiphlogistic treatment will often speedily remove the nervous symptoms, whilst the curvature remains unrelieved. Hence there is an impropriety in considering these nervous symptoms as a result of the deformity, and in explaining them upon the mechanical principle of pressure and stretching, to which the nerves are supposed to be subjected as they issue from the intervertebral foramina. If the pressure and stretching produced by the curvature, were the cause of the nervous symptoms, they ought to continue as long as the deformity remains.

Symptoms of affection of the brain frequently occur in conjunction with these diseases of the spinal marrow. These however must be regarded as the result of extension of disease from one part to the other, most probably through the medium of the membranes. I shall however, purposely avoid touching upon these subjects, as it would be foreign to my present purpose to enter upon the discussion of cerebral neuralgiæ.

Treatment.—When the different neuralgic symptoms which have been enumerated, can be traced to this morbid state of some portion of the spinal marrow, the treatment that ought to be pursued, is readily decided upon. Local depletion by leeches or cupping, and counter irritation by blisters to the affected portion of the spine, are the principal remedies. A great number of cases will frequently yield to the single application of any of these means. Some cases, which have even existed several months, I have seen perfectly relieved by the single application of a blister to the spine, although the local pains have been ineffectually treated by a variety of remedies, for a great length of time. A repetition of the local depletion and blistering is however often necessary after the lapse of a few days, and sometimes is required at intervals for a considerable length of time. In a few very obstinate cases issues or setons have been thought necessary; and where the disease has been very unyielding, a mild mercurial course has appeared beneficial.

It is of course necessary that proper attention be paid to the regular functions of the bowels, and to the treatment, by appropriate means, of any other affection which may co-exist. It is needless, in this form of disease, to offer any directions respecting diet, as the judgment of every medical man will enable him to decide best on the general management of the case immediately under his notice.

When my attention was first directed to this subject, I considered recumbency a necessary part of the treatment; it is, for a moderate length of time, undoubtedly beneficial, and frequently very much accelerates recovery; but subsequent observation has convinced me that it is

by no means essential. I have seen several instances of the most severe forms of these complaints, occurring in the poorer classes of society, where continued recumbency was impracticable, which have, nevertheless, yielded without difficulty to the other means of the treatment, whilst the individuals were pursuing their laborious avocations.

These observations, however, are not intended to apply to those cases in which there is actual disease of the vertebræ.

When there exists a tendency to relapse, I have thought it advantageous to continue the use of some stimulating liniment to the spine for a few weeks after the other means of treatment have been discontinued. A liniment, consisting of one part of spirit of turpentine, and two of olive oil, is what has generally been employed.

In illustration of these observations a series of cases will be recorded from my note books, and my object will be, not so much to swell their number as to select a few which may exhibit the principal varieties of these complaints. In relating them, I shall adhere as much as possible to anatomical order, commencing with the affections of the upper portions of the spinal chord, and gradually proceeding to those seated in the lower parts of it. I shall endeavour, in each case, to give a full description of the symptoms as they were observed at the first consultation, but shall avoid the tedious detail of daily reports, by condensing, as much as possible, the subsequent history, not, however, omitting a careful record of the effect of remedies, and of such peculiarities as some instances may present.

Case I.

Neuralgia of the Scalp.

June 5th, 1827. Mr. L., æt. 26, complains of a feeling of indisposition, having suffered for a few days from stiffness in the neck, and pain at the back of the head, extending laterally towards the ears, and upwards over the back part of the scalp; perspires much at night; feels languid and unable to attend to business. About four weeks ago he was exposed to the wet and cold, and has ever since been affected with these symptoms.

On pressing the spine there is tenderness in the first cervical vertebra, but no pain whatever is produced by firm pressure on any other part of the spine.

Leeches to be applied to the neck.

June 10th. The pains in the scalp were immediately relieved, on the application of the leeches, and the perspirations have gradually ceased. The spine bears pressure without any uneasiness.

Case II.

Intermittent Neuralgia of the Scalp.

June 18th, 1827. Mrs. B., a week after her accouchement, complained of pain in the head occurring in the afternoons in a violent degree. It was described as a dull, aching pain principally seated in the occipital region, but extending from that part over the parietal bones towards the temples, and in the neigh-

bourhood of each ear there was a small space more acutely painful than the rest; there were also pains darting over the scalp and along the upper part of the neck transversely towards the cheeks, and terminating along the edge of the lower jaw. She complained of violent pulsating sensations in the head, accompanied with distressing sounds, which she compared to the "beating of hammers." In other respects she was as well as her situation could admit of. She had suffered in a slighter degree from these symptoms for some time previous to her confinement. Leeches had been applied to the temples, but the paroxysms returned with equal or greater violence on the two following days.

On examining the spine, very great tenderness was detected on pressing the two upper cervical vertebræ, of which she had not been previously aware.

Leeches were applied over the cervical vertebræ, and immediate relief was obtained. No further return of the paroxysms was experienced.

In this case it should be observed that leeches had been applied to the seat of neuralgia without benefit, but the relief was immediate when they were applied near the origin of the affected nerves.

Case III.

Intermittent Neuralgia of the Scalp.

August 10th, 1829. W. S., a stout healthy-looking young man, complains of pain in the head and giddiness. The pain is described as a dull, heavy sensation at the back of the head, frequently extending over the crown

to the forehead. He also suffers from acute pains, which frequently dart from the occipital region to the front part of the head. Occasional feeling of weariness and aching about the shoulders. These uneasy sensations occur in paroxysms, generally in the mornings, which continue about two hours. Vertigo occurs frequently, not only during the paroxysm of pain, but also in the intervals. These complaints have been gradually increasing for several weeks. The bowels are regular, appetite good, and in other respects he is in good health.

Tenderness in the third and fourth cervical vertebræ. Leeches to be applied to the tender part.

14th. Much better. The pain returns at the usual time, but in a very slight degree. The vertigo is diminished, but still continues rather troublesome.

Blister to be applied to the neck.

18th. On the day after the blister had been applied, the vertigo was greatly diminished, and has since entirely disappeared. No tenderness on pressure is now perceived.

Similar cases of affections of the scalp might be multiplied to a great extent; they are of frequent occurrence, not only in these simple forms, but also in conjunction with other diseases. The pains in the head which occur in fevers, will often be found to be of this neuralgic character, and altogether independent of any cerebral affection. A few leeches to the tender vertebræ of the neck will generally produce immediate relief of this distressing symptom.

Case IV.

Neuralgia of the Upper Extremities and Thoracic Parietes.

December 10th, 1827. Mrs. B., æt. 53, mother of a large family, represents herself as having been severely afflicted with rheumatism during the greater part of her life. She now suffers from pain in the neck and head, pains about the clavicles, difficulty in moving the arms, which feel fixed at the shoulder joints. The pain in the neck and between the shoulders is fixed and constant, being nearly the same both day and night; it is a little alleviated by supporting the back against a chair. There are also darting pains extending from the cervical portion of the spine upwards over the occiput, and downwards across the neck and over each shoulder. Both arms are affected with aching pains over their whole extent, and with a sense of soreness on pressing or rubbing the skin; prickling sensations, cramps, and numbness in the fore-arms, hands, and fingers. Difficulty in moving the arms, and in using her fingers in sewing or knitting. Frequent sudden "twitching" pains in the neck, arms, and trunk; occasional pains in the abdominal muscles, relieved by recumbency. No affection of the lower extremities; appetite poor; no fever; no cough or difficulty of breathing; catamenia ceased about six years ago.

She has always considered the disease to be rheumatism, and has tried a great variety of remedies usually employed in that disease, but without much benefit.

Tenderness in the two lower cervical and six upper dorsal vertebræ.

Leeches were directed to be applied to the tender portion of the spine, and on the following evening a blister to the same part. Recumbency was also recommended.

The blister produced an unusual degree of inflammation in the skin, which continued several days, and was accompanied with considerable fever. During the febrile state the neuralgic symptoms were rather aggravated, but as the fever subsided, they gradually disappeared. On the 29th of December I took leave of her, as she was then perfectly well; she felt a degree of muscular power, particularly in the upper extremities, which she had not been accustomed to for several years; she was quite free from pain.

June 20th, 1829. Since the last report she has enjoyed good health, with the exception of occasional returns of the pain during winter, which were so slight as to produce but little inconvenience, and were soon relieved by leeches and the application of turpentine liniment to the spine. These last attacks were attended with flatulence.

Case V.

Neuralgia of the Mamma, or "Irritable Breast."

Mrs. ——, æt. 48, but without having experienced any change in the catamenia, of a healthy appearance, and mother of a large family, had suffered about seven years from a painful affection of the left breast. On examination it was found to be exquisitely sensitive to the slightest touch; it was somewhat increased in size,

and irregularly indurated, having a knotty feel, and an obscure sense of tumours as if the glandular structure were enlarged at different parts. The integuments and cellular substance between the breast and clavicle, and towards the axilla, were thickened. There was a constant sense of uneasiness in the part, but her chief sufferings arose from its highly sensible state, which constantly exposed her to pain from the irritation of her dress, or any accidental contact. Her spirits were depressed, and an apprehension that the disease would prove cancerous, although she was repeatedly assured of the contrary, was a source of great anxiety. Leeches, evaporating lotions, and warm fomentations had been employed, and medical treatment had been particularly directed to the digestive organs; these means were occasionally productive of slight alleviation, but never of permanent benefit. The complaint varied in degree, being sometimes less severe for a few weeks, without any obvious cause for the temporary amendment.

Whilst in this state (September, 1827,) she became subject to pains in the scalp, and vertigo, attended with flatulence. These symptoms directed my attention to the spine, which on examination was found to be tender in several parts. The most painful vertebræ were the second cervical, the seventh cervical, and two upper dorsal. Leeches were applied to these parts, with considerable relief to the pains in the scalp and vertigo. Since that time she has been occasionally in the habit of applying leeches, a blister, or a sinapism, of her own accord, when there has been any return of uneasiness in the head.

On making inquiry (August 10th, 1829,) respecting the complaint in the breast, of which I had not heard any

mention for several months, she tells me that from the time of her commencing the treatment by local applications to the spine, the affection of the breast has disappeared. The pain and swelling are removed, and the breast resembles the other in every respect.

The circumstance of finding a portion of the spine tender, and the removal of the tenderness by suitable remedies being unexpectedly accompanied with relief of the fulness and pain in the breast, could not fail to produce a powerful impression on my mind, and to excite a suspicion that this irritable affection of the breast was a neuralgia of that part dependent upon disease of the spinal marrow.

Case VI.

Neuralgia of the Mamma and Arm.

August 28th, 1828. Miss L., æt. 30, consulted me respecting an affection of the right breast.

The breast is considerably enlarged, and has an irregular knotted feel, particularly in the portion next the axilla. The slightest touch or pressure produces acute suffering. There is a constant gnawing sensation in the breast, shoulder, and arm. "Sharp darting pains" are often felt in the breast and arm. The right arm feels numb; is a little tumefied. The whole arm feels weak, particularly the wrist, so that she is scarcely able to sew. On suddenly touching the tips of the fingers pains are sometimes felt to strike up the arm to the neck and head, and down to the breast.

In other respects the health seems tolerably good. She is sometimes subject to indigestion, and the bowels

are generally confined. The catamenia regular and unattended with pain in the lumbar or pelvic regions.

For a few years she has had more or less of the pain in the breast, and irregular knotty induration, particularly at the menstrual periods; the affection, however, has seldom been very severe, until within the last four weeks, when the pain has become much more intense, and the swelling greater; and the usual subsidence of these symptoms after the catamenial period has not taken place.

Slight pressure on the fourth cervical and three upper dorsal vertebræ, produces great uneasiness.

August 28th. Eight leeches to be applied to the tender vertebræ, and a mixture of salts and senna to be taken until the bowels are moved.

29th. Pains rather less acute, but the tumefaction continues. Bowels have acted freely. A blister to be applied to the upper part of the spine.

30th. Has passed a bad night from the irritation of the blister; slight fever; affection of the breast and arm much the same. Take an effervescing draught every four hours.

September 3d. The irritation produced by the blister has subsided, and she feels much better. The breast bears pressure without inconvenience, and the tumefaction has considerably diminished. She can move the arm with rather more freedom.

10th. The pains in the breast and arm have a little increased. Ordered another blister to the same part of the spine.

17th. The pains have entirely ceased during this week, and the breast has nearly returned to its natural

size; she has attempted to sew, and can move the arm with considerable facility.

August 26th, 1829. I called upon this patient to-day to make inquiry respecting these complaints. She has not had any return of the affection of the breast, but occasionally feels a weakness and numbness in the right arm.

A few weeks ago, when at a distance from home, I was consulted by a lady respecting a painful affection of the left breast, which was enlarged and indurated in one part towards the axilla; the tumour appeared to have been produced by a simple enlargement of the glandular structure; the whole surface of the breast was painful on pressure, and she suffered from frequent pains darting from the neck over the breast and shoulder. The tumour had continued obstinate, notwithstanding the frequent use of leeches and iodine. On examining the spine the lower cervical vertebræ were found to be tender. I advised the occasional application of a blister to this part, but have not since heard from the surgeon who attended her.

These cases render it highly probable that the affection usually known as the "irritable breast," is a neuralgic affection of the part, dependent upon a morbid state of the lower cervical portion of the spinal marrow.

The description given by Sir Astley Cooper* of the irritable state of the breast, exactly coincides with the phenomena attendant upon these neuralgic affections.

* Illustrations of Diseases of the Breast, by Sir Astley Cooper, p. 76.

"When," says he, "the complaint affects the glandular structure of the breast, there is scarcely any perceptible swelling, but one or more of the lobes becomes exquisitely tender to the touch; and, if it be handled, the pain sometimes continues for several hours. The uneasy sensation is not confined to the breast alone, but it extends to the shoulder and axilla, to the inner side of the elbow, and to the fingers; it also affects that side of the body to the hip," &c. "Patients also state that heat and cold frequently succeed each other in the breast, and it would seem that the pain resembles that in tic-douloureux, darting like electricity through the part, and through the neighbouring nerves."

Case VII.

Intercostal Neuralgia.

Jan. 1, 1828. I was requested to visit Mr. H., æt. 40, who had been much out of health for several months. He complained of a constant pain in the right side of the chest, occupying the intercostal spaces between the fourth and seventh ribs. These spaces, to the extent of a few inches, were tender on pressure, and the pain was increased by deep inspiration; the intercostal muscles at this part were occasionally affected with spasm. His most intense sufferings, however, were caused by acute pains shooting through this part of the chest, extending to the back, and darting thence towards the shoulder; these pains would sometimes strike through the left side also, and then the chest felt completely encircled by the pain. The dull, fixed pain was constant

during the day, and became a little relieved by recumbency; the darting pains recurred at intervals of a few minutes throughout the day, were less frequent, but occasionally very severe during the night. He suffered sometimes from similar darting pains, but of less violence, in the scalp. Pulse natural; tongue slightly furred; bowels regular; appetite deficient; occasional flatulence; frequent cough, without expectoration; considerable emaciation.

His symptoms have existed in this degree of severity, about five or six weeks; but for a few months he has been much out of health, and has gradually lost flesh. He has frequently suffered from the pain in the side for ten years, and has seldom been entirely free from it. A few years ago, considerable fear was entertained that he was consumptive; and his friends have lately felt great anxiety from a similar apprehension, more particularly as he has sustained the severe loss of an amiable wife from pulmonary disease a few months ago. He has lately undergone a great variety of medical treatment, without relief; leeches and blisters have been applied to the painful part of the chest, without benefit.

On examining the spine, there was a very decided tenderness in the third and fourth dorsal vertebræ, of which he was not previously aware; but on his attention being directed to this part, he recollected that it had often been the seat of a sensation of heat and of some uneasiness; and remarked, that the darting pains in the chest appeared to strike to and from that part.

The plan of treatment recommended, consisted in recumbency, and local antiphlogistic remedies to the tender part of the spine. From the 1st to the 25th of

January, dry cupping was twice employed, leeches twice, a blister three times, and a sinapism once. This may appear a rapid repetition of painful remedies in so short a time; but they were generally repeated at the request of the patient, from the decided relief of the pains in the chest, which he obtained after each application. After the 25th, a degree of irritation was kept up in the skin over the tender vertebræ, by a liniment containing oil of turpentine. The medical treatment was extremely simple; consisting of an occasional dose of rhubarb, and an effervescing draught, which he found grateful in allaying a troublesome sensation of thirst. By the 25th of January he was so much relieved as to resume his usual avocations, the pain in the side could only be perceived occasionally, and in a very slight degree. He was directed to take the sulphate of quinine, and to continue the use of the liniment for a few weeks. On the 20th of February he considered himself perfectly well.

Aug. 26th, 1829. Since the last date he has enjoyed better health than for several preceding years, has gained flesh and become stout in figure. He has entered with great activity both into his business and recreations. A few times, "after taking cold," he has felt slight uneasiness in the back and pain in the side; but these were so trifling as to occasion no inconvenience.

Case VIII.

Neuralgia of the Abdominal Parietes and Lower Extremities.

June 10th, 1828. Mr. Thomas B., æt. 20, complains of "pain across the body, weakness in the lower extremities, and soreness in the thighs." The pain in

the abdomen is fixed, not much increased on pressure, and appears seated in the middle portion of the recti muscles; the soreness of the thighs extends along their anterior and inner surface, and down the legs in the direction of the anterior surface of the tibiæ; his legs totter, and he frequently feels a tendency to falling, from the legs sinking under him. He does not appear to have any affection of the stomach, or any internal disorder. The present symptoms have existed three or four weeks, and are gradually increasing.

Great tenderness on pressing the second and third lumbar vertebræ.

Ten leeches to be applied over the lumbar vertebræ, and a dose of castor oil to be taken in the morning.

15th. The soreness of the thighs and the feeling of weakness in the lower extremities perfectly relieved; the pain in the abdomen is diminished, but still exists. Apply a blister to the back.

19th. He is now free from the pain in the abdomen, feels languid, but in other respects is quite well. No tenderness in the vertebræ can now be perceived. Take an ounce and a half of infusion of cascarilla three times a day.

Case IX.

Neuralgia of the Knee.

August 10th, 1829. E. B., æt. 18 years, a girl of a delicate constitution and in a very humble station of life, is admitted a patient of the dispensary on account of an affection of the left knee.

She complains of violent pain in the knee, principally

situated about the ligament of the patella and in the popliteal space; from these parts the pain darts upwards along the outer side of the thigh towards the loins. It comes on suddenly for a few minutes and then leaves her free for a short time; towards afternoon the intervals of ease become shorter, until at last the pain is almost constant; during the evening it gradually diminishes, and before she retires to bed in a great measure ceases. Whilst the pain is severe, there is considerable tumefaction of the knee, but no redness, and the skin is exquisitely sensible to the touch; in the absence of the paroxysms the swelling subsides, and the skin bears pressure without inconvenience. The pain is often accompanied with a feeling of numbness across the middle of the thigh. No affection of the right leg, or of the upper extremities. She has suffered severely during the last month, and since November has had several attacks of a similar kind lasting for a few weeks. The complaint was produced, she supposes, by working in a damp kitchen.

She appears in a delicate state of health in other respects, having a cough and some expectoration. The catamenia are regular. The appetite is deficient, and the bowels are relaxed and rather irritable.

She feels a great degree of aching and weariness in the lower part of the back, and the lower lumbar vertebræ are very tender on pressure.

Since November, she has frequently had leeches and blisters applied to the knee, and the pain was always mitigated in violence by them, for two or three days, but never entirely removed, and always returned in a short time; when any more permanent amendment took

place it appeared independent of any remedies that were used.

August 10th. Ordered a blister to the lumbar vertebræ, recumbency, a mucilaginous mixture for the cough, and a medicine containing small doses of tincture of opium combined with magnesia, to allay the irritable state of the bowels.

August 17th. The day after the application of the blister, the pain was removed, and throughout the week she has scarcely perceived it; a great degree of weakness continues and a feeling of numbness. From the benefit derived from the blister, she is anxious to have another applied, and her request is granted.

August 24th. She has continued almost entirely free from pain; the limb still feels weak, but she can walk better than she has done since last November. The disease of the lungs continues, and I fear may ultimately prove serious.

This case shews clearly the effect of the treatment upon the neuralgia, and, although the pulmonary symptoms remain, it is quite certain that they are totally independent of any affection of the nervous system.

I am aware that this is one of those affections of the knee, which have been termed "Hysterical," but I cannot help thinking that our knowledge of diseases is retarded, rather than advanced, by assigning to them names which have no definite signification.

A few weeks ago, another case of neuralgia of the left knee was under my care at the dispensary, which was relieved by blisters over the lumbar vertebræ. They were applied four times at intervals of a week. The complaint has not returned, although it had previously existed many weeks.

In laying great stress upon the nature of these diseases and the treatment applicable to them, I would by no means have it supposed that success is invariably attendant, or that disappointment may never occur. Medical science has not yet arrived at a state of perfect infallibility, and failures will occasionally be met with in the treatment of these as well as of most other diseases, although the diagnosis may have been correct and the plan adopted most judicious.

IRRITATION

OF THE

GANGLIA OF THE SYMPATHETIC NERVE.

The ganglia of the sympathetic nerve appear subject to a state of disease similar to that which has been described in the preceding chapter, as occurring in the spinal marrow.

As the disease may be confined to one part of the spinal marrow, or may exist simultaneously in different portions, or may even pervade its whole extent, so the affection of the ganglia may be confined to one of these nervous masses, may exist in several which are contiguous, or in ganglia remote from each other; and, as there is reason to believe, the whole chain may occasionally be affected.

The disease of the ganglia is seldom found, except in conjunction with that of the corresponding portion of the spinal marrow, whereas the spinal marrow is often affected without the neighbouring ganglia being under the influence of disease. Thus we frequently find symptoms of disease in a portion of the spinal marrow without any evidence of its existence in the corresponding ganglia, frequently the symptoms of both combined,

and occasionally, but rarely, symptoms referable to the ganglia, without the spinal marrow being implicated.

The principal symptoms resulting from irritation of the ganglia of the sympathetic, are to be found in those organs which derive their nerves from this source. They consist of perverted functions of these organs, and are exemplified by a variety of phenomena. The *involuntary muscles*, deriving their power from the sympathetic, have their action altered, as is evinced by spasms and irregularity in their contractions. The heart is seized with palpitations, the large vessels with inordinate pulsations; the muscular fibres connected with the bronchial apparatus are thrown into spasm, constituting a genuine asthma independent of bronchial inflammation. The muscular fibres of the stomach and intestines become the seat of spasm, and of various other deviations from their natural operations. The *sensibility* of the organs, which derive their sentient power from the great sympathetic, is variously perverted, the nervous filaments being the seat of pains. The heart and lungs, for instance, are subject to morbid sensations, bearing great analogy to those which have been designated "tic douloureux" when occurring in the spinal nerves. The stomach and intestines are liable to similar neuralgiæ, to which the names gastrodynia and enterodynia have been applied. The kidneys, the bladder, and the uterus, are liable to the same perverted state of their sensibility. The *secretions* also undergo alteration, products being formed, which in health have no existence. This is exemplified by the enormous secretions of air which sometimes occur in the stomach. Large quantities of clear transparent liquid are also

secreted by this organ, constituting what is called pyrosis. The secretions of the stomach undergo variation in their qualities, rendering them unfit for the digestive process. It is probable that the secretion of the liver also experiences some alteration in these complaints. The urine is sometimes influenced, and I am inclined to suspect that some forms of diabetes partake of a neuralgic character. Leucorrhœa is frequently a concomitant of these diseases, and ceases on their removal; but I am not prepared to say that it is ever symptomatic of them. Irregularities in the catamenia are often observed, the discharge being generally in excess.

The ganglia most liable to the disease are the middle and lower thoracic, from which the splanchnic nerves are derived, giving rise to various disorders of the stomach and digestive organs, which will hereafter be more fully discussed. Next in frequency is the affection of the cervical ganglia, producing painful and spasmodic states of the heart. The symptoms denoting disease of other ganglia, although occasionally met with, are less frequent in their occurrence. Irritability of temper and depression of spirits often attend these complaints, particularly when the stomach is the part which suffers.

The disease of the ganglia, like that of the spinal marrow, is not necessarily connected with disease of the vertebræ or distortion of the spine. It may co-exist with these complaints, and, when it does so, the symptoms proper to the ganglionic disease are often erroneously supposed to be produced by distortion, or by disease of the vertebræ; they are, however, frequently relieved by treatment, whilst the disease of the bones remains uninfluenced by it, and the most extreme dis-

tortion of the spine or destruction of the vertebræ from inflammation, may exist without there being any symptoms attributable to neuralgia of the sympathetic nerves.

In conjunction with the symptoms denoting disease of the ganglia, tenderness to a greater or less degree may generally be found on pressing some part of the spine, and the tender portion invariably corresponds with the symptoms; or rather, the seat of tenderness is near the part occupied by the particular ganglia from which the nerves of the disordered organ are derived; for example, when the heart is affected, the tenderness is found in some of the cervical vertebræ, and when the stomach is the seat of complaint, it is in some of the middle or lower dorsal vertebræ.

With respect to the treatment, I have but little to add to what has been said in the preceding chapter respecting the treatment of irritation of the spinal marrow. Leeches, cupping, blisters, &c., to the neighbourhood of the affected ganglia, constitute the essential part. Some internal remedies are useful as adjuvants or palliatives; as quinine, iron, and other tonics, when the violence of the complaint has been subdued, and an intermittent state still continues; digitalis and prussic acid, in palpitations and unnatural pulsations; prussic acid, bismuth, and opium in gastrodynia, pyrosis, and unnatural sensibility of the stomach; and opium in severe spasms or pains in the nerves. These remedies, however, are seldom necessary; and when alone relied upon, without any treatment being directed to the affected ganglia, often fail, even of giving temporary relief. Of still less efficacy, either temporary or permanent, are external remedies, as leeches or blisters,

when applied to the region of the heart or stomach, if these organs are the seat of neuralgia. I have seen cases of nervous affections of the heart, (palpitations unattended with organic disease,) which for months had resisted the employment of digitalis, blisters to the chest, and various other remedies, yield immediately to the application of a blister over the cervical portion of the spine. Numerous instances of stomach complaints, which for a length of time had been an annoyance to myself as well as others, when treated by local remedies to the epigastrium, and by medicines called stomachic, have disappeared as if by magic, on the employment of leeches or a blister over the lower dorsal vertebræ.

To illustrate more fully these affections of the sympathetic system of nerves, I will separately treat of neuralgia of the heart, and neuralgia of the stomach.

NEURALGIA* OF THE HEART.

Palpitations, unconnected with any structural disease of the heart, are not of unfrequent occurrence. They are generally considered as dependent upon some disease of the nerves of the heart, from which they are designated "nervous palpitations." As far as I have observed, all ages are liable to the complaint, and nearly in an equal degree. The sexes appear almost equally obnoxious to it; perhaps, however, the preponderance may be given to females. These

* It must be borne in mind that the term neuralgia is here used in its more extended signification, not being confined to those affections which are attended with *pain*, but also applied to other morbid states of the functions of nerves.

unnatural beatings or contractions of the heart, at the commencement of their attack, or when they exist but in a slight degree, occur in paroxysms at distant intervals, and only after exercise or some mental emotion, and after a short interval of quietude gradually disappear. As the complaint advances, the paroxysms become more frequent, violent, and of longer duration; they are produced by slighter causes, until at length the heart becomes so irritable that the mere act of walking or of speaking, changes of position from the sitting to the erect posture, and the reverse, the slightest mental agitation, in fact any cause sufficient to produce a momentary though slight increase in the afflux of blood to the heart, becomes sufficient to disturb the harmony of its contractions. The intervals of the paroxysms gradually become less and less distinct, until at length the state of irritable, incomplete, and irregular action is seldom or never superseded by regular, decisive, and rhythmical contractions.

This state of the heart, I have already remarked, depends generally, if not always, on a morbid state of the cervical ganglia of the sympathetic.

The palpitations are often attended with other symptoms peculiar to or dependent upon the same disease of this portion of the ganglionic system; as pains in the heart and lungs; there being frequently a dull, aching sensation, sometimes decidedly referable to the heart itself, sometimes felt through a part or the whole of the pulmonary structure. These pains are often compared to rheumatism. Occasionally they are seated in the upper portion of the aorta, or in the neighbourhood and somewhat pursuing the course of the carotids and subclavians. The muscular apparatus of the

bronchial tubes is occasionally affected with spasm producing a true asthma, but this is far from being a constant or even frequent attendant upon nervous palpitations.

I have already alluded to the fact, that this affection of the ganglia is generally attended with the disease of the adjacent portion of the spinal marrow, the symptoms of which have already been described. Hence we generally find nervous palpitations and neuralgic affections of the heart and lungs, accompanied with certain symptoms referable to the cervical spinal nerves; as pains of a great variety of kinds, sometimes darting along the cutaneous nerves of the head and neck; fixed pains about the clavicles, scapulæ, or shoulders; pains, numbness, tremors, and weakness in the arms and in the upper and anterior parts of the chest. These symptoms often form a prominent feature in the account which the patient gives of his complaints, and in his mind take precedence of the palpitations. Upon the whole the pains exist most frequently and most intensely on the left side of the body, sometimes equally on both sides, occasionally, though rarely, they are confined to the right.

Palpitations, purely nervous, are principally distinguished from palpitations dependent upon organic disease of the heart, by the absence of other symptoms which denote a change of structure in that organ; in hypertrophy, the pulsations of the heart are more vehement and more uniform; in dilatation, they are felt over an unnatural extent of the chest; when there is obstruction to the circulation from contracted orifices, from loss of function in the valves, or from morbid alterations of the muscular structure, there are generally, in a greater or less degree, blueness, œdema, &c. These symptoms, in general, are sufficient to distinguish the two affections;

I will, however, add to them the stethoscopic distinctions enumerated by Laennec: 1. The heart is found to be of natural size; the sound, though clear, is not strongly heard over a great extent. 2. The shock, although apparently strong at first, has, in reality, but little impulse, for it does not sensibly elevate the head of the observer. The last sign he regards as most important, when, in addition to it, we consider the frequency of the pulsations, which is always greater than natural.

The nervous affection of the heart may also exist in conjunction with organic disease, and is a frequent, though by no means universal cause of the paroxysmal exacerbations in diseases of the heart. I have seen several instances of *organic disease of the heart*, connected with tenderness in the cervical portion of the spine, in which the paroxysms have been greatly relieved by means directed to the neighbourhood of the cervical ganglia. It is an interesting subject for inquiry, how far nervous affections of the heart predispose to or excite organic diseases of this part. I confess myself unable to speak decidedly upon this point. Dr. Darwall seems to favour the supposition. Laennec, however, remarks, "It is commonly supposed, that nervous palpitations, (supposing the action of the heart to be habitually in excess,) will at length produce hypertrophy of this organ. I do not deny the possibility of it, but I must say that I have never seen any thing which proves this opinion to be well-founded. I know some persons who have suffered from habitual palpitations more than ten years without there being any real sign of hypertrophy or of dilatation."*

* Traité de l'Auscultation, &c. vol. ii. p. 753.

Other symptoms are occasionally met with in conjunction with nervous palpitations, but they must not be regarded as essential to the complaint; these are the corded sensations round the waist, constriction across the epigastrium or lower portion of the sternum, flatulent distention of the stomach, &c.; these symptoms frequently attend the affection of the cervical ganglia, but are by no means universally connected with it, and will hereafter be shewn to depend upon disease of another portion of the ganglionic and spinal systems. They frequently co-exist with organic affections of the heart, from which cause they are often erroneously arranged amongst the symptoms of those diseases.

The treatment of nervous palpitations and neuralgic affections of the heart and lungs, has in general proved very unsatisfactory. The means employed as remedies have been various in the extreme. These complaints have been treated by anodynes, antispasmodics, and tonics; by bleeding, digitalis, and prussic acid; by electricity, galvanism, and magnetism; and by irritants and depletory measures applied to the *anterior* parts of the chest. These means have generally failed to give relief, and some of them have even aggravated the disease. Not unfrequently has it happened that the unfortunate subject of nervous palpitations, after having tried in succession almost innumerable remedies, and having repeatedly changed his medical attendant, is obliged to endure with patience his distressing nervous companions, and console himself with the assurance that his complaint is "*seldom attended with danger.*" I feel considerable confidence in stating, that when the disease is treated upon the principle which I have laid down, namely, of referring the palpitations and pains in the heart to disease of

the cervical ganglia, the most beneficial results will, in the generality of cases, be obtained.

NEURALGIA OF THE STOMACH.

Various diseases are included under the terms dyspepsia, indigestion, and stomach complaint, and depend upon different morbid conditions of the stomach. Perhaps the most frequent cause of these complaints is chronic gastritis, under which I would include all the varieties of chronic irritation and chronic inflammation of the stomach, regarding these terms as denoting different grades of the same affection. This form of dyspepsia usually yields to the employment of leeches to the epigastrium, and moderate abstinence; and when the sensibility of the stomach is morbidly increased, opium or prussic acid in small doses are often given with advantage. A state of simple indigestion, apparently from mere atony of the stomach, is often observed during convalescence from other diseases; in this form of complaint the stomach appears to participate in the debility of the general system, and tonics, as quinine and other vegetable bitters, the mineral acids, &c., are influential in restoring the digestive powers.

There are, however, numerous other cases of stomach complaints, bearing considerable resemblance to the two forms already mentioned, which, nevertheless, are not remedied by the treatment found so beneficial in those affections. Leeches to the epigastrium and abstinence are of no avail; anodynes produce no permanent relief, tonics and astringents are inert; emetics and purgatives, particularly when in opposition to reason and common sense, their employment is persevered in for a great

length of time, often aggravate the disease and render it complicated with gastritis. Cases of this kind must have occurred to most medical men, and I freely acknowledge, that I have often been teazed and perplexed with them, and have felt it a relief when my patient has been induced to betake himself into the country, or has transferred his confidence to some other member of the profession. Many of these cases, which had resisted the usual modes of treatment, I have since found to be connected with tenderness on pressing some of the middle or lower dorsal vertebræ; and on removing the tenderness in the spine and neighbouring parts by proper remedies, the stomach affection and attendant symptoms have been almost immediately relieved. From observing several instances of this kind, I was led to consider this disordered state of the stomach strictly as a nervous affection of that organ, dependent upon irritation or inflammation of those nervous masses or ganglia from which the splanchnic nerves are derived. The tenderness in the neighbourhood of these ganglia strengthened the supposition, and the result of the treatment still further confirmed it.

In the affection, which I have now more particularly to describe, the functions of the stomach are impaired, and it becomes the seat of various morbid phenomena, which may be easily mistaken for chronic gastritis.

The principal symptoms denoting the complaint, in addition to tenderness in the neighbourhood of the middle and lower thoracic ganglia, are,

1. Indigestion, or simple impaired digestive power, from which the food, instead of undergoing those changes which constitute healthy digestion, becomes subject to the control of the ordinary chemical affini-

ties; decomposition takes place, new compounds are formed which differ materially from healthy chyle, acids in unnatural quantity are produced, air is disengaged, and a variety of distressing symptoms are the result; as flatulence, acidity, distention of the stomach, and several others, in which the whole system more or less participates.

2. Pain in the stomach.—The pain is sometimes diffused over the whole epigastrium, occasionally it is concentrated in a comparatively small compass; it is often described as an aching pain resembling rheumatism, as a gnawing sensation, or as a feeling of a heavy ball in the stomach. Frequently, when the pain has been of long duration, there is actual tenderness on pressing the epigastrium, such as we often find on pressing those parts which have been for a length of time the seat of neuralgia from an affection of the spinal nerves. Under this head might be ranged a sense of faintness, and what is described as a *sinking* sensation at the stomach.

3. Flatulence.—One of the most marked symptoms of the affection of the ganglia, and which is more regularly found than any other, is Flatulence. It differs from the slight disengagements of air from *decomposition* of undigested aliment, already described in speaking of indigestion. This slight degree of flatulence, which is generally attended with acidity, is simply indicative of indigestion, and may occur in this nervous affection, in gastritis, or in any other complaint when a portion of food remains a considerable time undigested in the stomach; but the flatulence to which I now allude, and which I consider more particularly

characteristic of the affection of the ganglia, consists in a copious *secretion* of air. Occasionally, the air is formed almost instantaneously, the stomach becoming suddenly distended, and at length relieved by loud and copious eructations. Sometimes the secretion of air is less rapid in its formation, but more protracted, the discharges taking place at short intervals, and continuing many hours and even days. Sometimes the secretion is slightly alleviated by recumbency; frequently it is increased by the ingestion of food, which seems not merely to add to the quantity of air in the stomach by its decomposition, but also by actually increasing the secretion. Pressure on the painful vertebræ, in some instances, causes a sudden extrication of gas.

4. Pyrosis.—A copious secretion of clear liquid is not an unfrequent attendant upon this affection. It is not so common as the former symptom; sometimes the two are combined; sometimes the pyrosis is connected with gastrodynia; and occasionally it is the only symptom of stomach affection to be detected.

5. Pulsation in the epigastrium is of frequent occurrence.

6. Affections of the spinal nerves.—In treating of the affection of the cervical ganglia, it was remarked, that the symptoms of disease in those ganglia were generally attended with symptoms denoting an affection of the corresponding portion of the spinal marrow. In like manner, when we are led to believe the lower thoracic ganglia to be the seat of disease, we generally, though not always, find some phenomena of an affection of the dorsal spinal marrow. These are, a corded sensation round the waist, constriction across the epi-

gastrium even when the stomach is not distended, soreness along the edges of the ribs sometimes increased on pressure, pains in the lower intercostal muscles, or in the muscles of the abdomen.

On reviewing these symptoms, it will be seen that some of them are common to gastritis as well as to the affection of the ganglia, and others are more particularly characteristic of the latter. Indigestion and its consequences, as acidity, flatulence from decomposition, &c., may arise equally from disease affecting the surface where digestion is performed, or from disease of the part where the nerves engaged in digestion originate. Pain in the epigastrium is common to both diseases, but in the nervous affection it is generally described as a dull, aching sensation; in gastritis the pain is more frequently accompanied with a feeling of heat, and is more particularly, though not always, increased by the ingestion of warm liquids. Tenderness on pressing the epigastrium more commonly attends chronic gastritis than the disease of the ganglia. The sensations of faintness and sinking seem common to both complaints. Flatulence from secretion, I believe, is seldom dependent upon gastritis, and is the most frequent of any symptom of the ganglionic affection. Pyrosis, I believe, is always attributable to the affection of the ganglia, and I think is never produced by inflammation of the mucous membrane of the stomach. The various affections of the spinal nerves, though not always attendant upon disease of the ganglia, are seldom absent, but they are never essential to, and but rarely accompany chronic gastritis; writers on dyspepsia, however, often confound these affections, and explain the spinal neuralgic symptoms on the vague

principles of sympathy. In addition to these diagnostic marks, one peculiar to gastritis may be mentioned; this is the red, and sometimes prominent state of the papillæ of the tongue, particularly at its tip and edges; the tongue is also loaded, and a slight febrile state is more frequent in chronic inflammation of the stomach, than in the nervous affection.

From a careful consideration of the symptoms, it will not in most cases be difficult to establish a diagnosis, particularly when the suspicion of disease of the ganglia is corroborated by the circumstance of there being tenderness in the neighbourhood of the splanchnic ganglia.

Although there is a decided difference in the two complaints, yet it is not uncommon to find them co-existing. This occurrence is what might be expected, for we can scarcely suppose the long existence of disease in the ganglia impairing the digestive functions, and consequently subjecting the mucous membrane of the stomach to the repeated and long continued irritation of imperfectly digested aliment, without the production of actual inflammation in that organ; hence, we not unfrequently find the co-existence of symptoms peculiarly characteristic of each complaint, and consequent advantage from the treatment being directed not merely to the spine, but also to the epigastrium.

A very frequent complication of this disease of the splanchnic ganglia is with the same affection of the cervical ganglia and spinal marrow, which has already been described. Hence there is often found tenderness in some of the lower dorsal and in some of the cervical vertebræ at the same time; consequently there are symptoms of affection of the stomach, as flatulence,

pain, distention, pyrosis, &c. with stricture across the epigastrium, corded sensations round the waist, and neuralgic pains in the trunk, and these are accompanied by palpitations of the heart, and pains, weakness and numbness of the upper extremities.

The affections which have been described principally refer to the heart and stomach; other organs, however, I believe are occasionally affected from a similar cause; the lungs are the seat of painful and spasmodic affections, producing true asthma; the small and large intestines, the kidneys, the bladder, and uterus, are not unfrequently the seat of neuralgia, connected with tenderness in the spine, and remediable by means directed to the tender part.

It is of great importance to bear in mind the circumstance that these nervous affections sometimes accompany other diseases. When the vertebræ, or intervertebral cartilages are inflamed, the neighbouring nervous tissues often participate, and neuralgic symptoms are the result. These nervous affections often constitute the most distressing part of the complaint, and, by proper attention to them the sufferings of the patient may from time to time be alleviated during the lingering progress of the vertebral disease. In fevers, symptoms of a neuralgic character often make their appearance, and aggravate the sufferings of the patient. The following case lately occurred to me. A young lady, having proceeded in a favourable manner for two or three weeks under common fever, became affected in the afternoon with paroxysms of oppression in respiration, attended with severe aching pain and constriction round the waist.

These symptoms returned about the same hour for four or five days, gradually increasing in violence until they became truly alarming; tenderness was discovered in two or three of the dorsal vertebræ, and a few leeches applied to the painful part, prevented the recurrence of the attacks. The fever afterwards pursued the usual course, and ultimately terminated favourably. Neuralgic affections of the scalp, connected with tenderness in the cervical vertebræ, often occur in fever, and are sometimes mistaken for pain of the encephalon. In phthisis, pains in the intercostal muscles, and oppression of respiration, are often of a neuralgic character, and readily admit of alleviation; the more formidable disease of the lungs, however, seems to predispose to their recurrence.

Dr. Brown has observed neuralgic pains in the neck and scalp accompanying severe inflammatory affections of the fauces, and has also met with similar symptoms in conjunction with hepatitis. My own observation enables me to confirm these remarks of Dr. Brown. The principal neuralgic symptoms which I have observed in conjunction with hepatitis, are constriction across the epigastrium and pain or tenderness along the cartilages of the ribs. This pain is sometimes supposed to be seated in the liver when the right side is affected, but a precisely similar affection is as frequently met with on the left. I have known this neuralgic affection to be treated as hepatitis when there has not been any real evidence of disease of the liver. A patient is now under my care, who is suffering from hepatitis, as denoted by yellowness of the skin, bilious urine, clay-coloured fæces, and deep-seated tenderness beneath the cartilages of the ribs; during the course of this complaint, he was for several mornings in succession attacked, about five o'clock, with

pain and constriction across the epigastrium which he compared to cramp, flatulent distention of the stomach and intestines, pain along the cartilages of the lower ribs on each side and on pressing these parts a degree of soreness was felt; the attacks continued from one to two hours, during which great restlessness was produced. Tenderness was detected in the vertebræ, and a blister has quite removed the paroxysms.

These circumstances point out the important fact that irritation of the capillary expansions of nerves may sometimes excite actual disease in the parts where the nerves originate.

PHYSIOLOGICAL

AND

PATHOLOGICAL OBSERVATIONS.

Before adducing any cases in illustration of the opinions which have been advanced, it may be well to inquire how far the views which have been taken are consistent with anatomical and physiological facts.

This inquiry becomes necessary, since the organs, which are most frequently the seat of these affections, are supplied with nerves from two sources. From the cerebro-spinal system, through the medium of the pneumo-gastric nerve, and from the sympathetic system through the filaments derived from the ganglia. On this account it is an interesting subject for inquiry, how far the symptoms are dependent upon an affection of the cerebro-spinal or of the sympathetic system of nerves. The prosecution of this part of the subject will be best facilitated by investigating the following queries.

1. Is the muscular action of the heart, arteries, stomach, and intestines, dependent upon the cerebro-spinal or upon the sympathetic system?

2. Are painful affections of the heart, lungs, stomach and intestines, seated in the filaments of the pneumo-gastric or of the sympathetic nerves?

3. Is the pneumo-gastric nerve the *only* nervous agent in digestion, or do the nerves of the sympathetic system exert any considerable influence in the digestive process?

1. *Is the muscular action of the heart, arteries, stomach, and intestines, dependent upon the cerebro-spinal or upon the sympathetic system of nerves?*

This part of the inquiry may appear unnecessary, as the dependence of the muscular action of these organs upon the sympathetic system is now so universally admitted; it may, however, be well to state the grounds upon which this fact is established.

Haller ascertained, by experiment, that the heart was capable of acting after the brain was destroyed.

Many acephalous fœtuses have been observed without brain and spinal marrow, in which the heart and arteries must have been for several months in continued action, as evinced by the formation from the blood of the various structures of which the malformed bodies were composed. In the Histoire de l'Academie Royale des Sciences for the year 1711, a case is related which M. Fauvel exhibited to the academy. The fœtus was of the full term; it had neither brain, cerebellum, nor spinal marrow, although it was well formed in other respects. In the volume of the same work for the year 1712, another case is recorded. This, also, was a fœtus of the full term, which had neither brain nor spinal marrow; the dura and pia mater formed a canal in the vertebræ. Numerous other instances, similar to the above, have been observed.

In the experiments of Dr. Wilson Philip it was seen that the cervical portion of the spinal marrow, the whole spinal marrow, and even the brain also, might be destroyed, without apparently affecting the action of the

heart, provided artificial respiration be maintained. It was observed that, when the brain and spinal marrow were destroyed, and artificial respiration maintained, *the circulation remained vigorous*, and black or red blood flowed according as artificial respiration was performed or not.* Similar results had previously been obtained by Le Gallois,† and have since been confirmed by the experiments of Mr. Clift on the carp. He found, that "the action of the heart continues long after the brain and spinal marrow are destroyed."‡

The capillary or secreting vessels, like the heart and large vessels, appear equally independent of the brain and spinal marrow. Dr. W. Philip, after removing the head of a frog, and preventing hemorrhage by ligature round the neck, and afterwards destroying the spinal marrow, brought the web of the hind legs before the microscope, and "found the circulation in it vigorous for many minutes, and in all respects resembling that in the web of a healthy frog."§ Nor is it merely ascertained that the capillary or secreting vessels are capable of transmitting or circulating the blood, independently of the brain or spinal marrow, but actual secretion may take place, as is observed in the formation of bone, cartilage, muscle, &c. in those monsters which have no brain nor spinal marrow. In a case related by Mr. Young,‖ in addition to the secretions which contribute to nutrition, meconium was found in the intestines.

With respect to the muscular action of the stomach

* Philosophical Transactions, 1815.

† Experiences sur la Principe de la Vie, &c. p. 37. *Paris*, 1812.

‡ Phil. Trans. 1815.

§ Experimental Inquiry into the Laws of the Vital Functions. Second Edition, p. 77.

‖ Medico-chirurgical Transactions, vol. i.

and intestines, we have abundant proof in the experiments of Dr. W. Philip, of its independence of the cerebro-spinal system. After relating an experiment in which the spinal marrow was removed, he records the following:—"The spinal marrow was wholly removed in another rabbit, also deprived of sensibility by a blow on the occiput, without at all affecting the motion of the stomach and intestines. The removal of the brain we found produces as little effect upon it, as that of the spinal marrow. When both were removed at the same time, it remained unaffected. It continues till the parts become cold, &c."*

From the various facts which have now been related, it is evident, that the involuntary muscles, which derive their nerves from the sympathetic, have a power of action independent of the nerves of the brain and spinal marrow. It is true, that the action of the heart is a little influenced by the brain and spinal marrow. Dr. W. Philip found that the application of stimulants and sedatives to these organs, produced a slight alteration in the pulsations of the heart; and Mr. Clift observed that the pulsations of the heart were sometimes rendered a little slower, sometimes quicker for a few beats, after the infliction of various injuries on the brain and spinal marrow. This slight influence which the brain and spinal marrow exert over the action of the heart, is what might be expected from the numerous nervous connexions which exist between the cerebro-spinal system of nerves and the nerves of the sympathetic system; but how trifling does this influence appear, when we find that the heart continues to beat with regularity and

* Experimental Inquiry, p. 130.

decision, and can maintain the circulation after the brain and spinal marrow have been removed, and that secretion can take place even where they have never existed.

2. *Are painful affections of the viscera seated in the filaments of the pneumo-gastric or sympathetic nerves? or, is the pneumo-gastric nerve ever the seat of pain?*

It was the opinion of Desportes,* that painful affections of the heart and lungs had their seat in the pneumo-gastric nerve; and Laennec† supposed that these pains were sometimes seated in the pneumo-gastric, and sometimes in the filaments of the great sympathetic.

That these opinions are unfounded will appear from the following observations.

The analogy and connexion between the portio dura of the seventh nerve and the pneumo-gastric are so striking as to excite the strongest suspicion that their functions or properties are similar. They both arise by a single series of fibrils from a distinct portion of the spinal marrow, and not by double origins, or by distinct roots from the two great spinal columns, like the fifth pair, and the spinal nerves, which bestow sensibility. In many animals these nerves are intimately connected towards their origin. In fishes and birds the portio dura arises with the branches of the eighth pair. In the duck, the portio dura is closely connected with the eighth, and has but little connexion with the auditory.

Mr. Bell observes, that there is, in fact, no portio

* Traité de l'Auscultation Médiate, &c. par R. T. H. Laennec, 2nd edition, vol. ii. p. 748.

† Ditto.

dura of the seventh in fishes, the nerve resembling it *being a branch of the eighth pair.*"*

From the intimate connexion and resemblance between these two nerves, any experiments tending to illustrate the functions of the one, would establish a great probability as to the functions of the other. The following observations have been made respecting the portio dura. Mr. Bell remarked, in numerous experiments, that the act of cutting this nerve was unattended with any expressions of pain, and that it might be touched and irritated without pain being produced; these facts were strongly contrasted with the effects of cutting or irritating the fifth, for, by even touching this nerve, acute pain was produced. These effects were so striking, as Mr. Bell observes, that, when the two nerves are both exposed, in the living animal, not the slightest doubt will remain in the mind of the experimenter which of the nerves bestows sensibility. Mr. Broughton,† having exposed the trunk of the portio dura in a horse, states, that "it was transfixed with a pin, pinched, and cut through slowly with scissors, and not the slightest sign of sensation was manifested." These experiments of Mr. Bell and Mr. Broughton establish the fact that the portio dura is not a nerve of sensation; and the similarity of this nerve to the pneumo-gastric would lead one to infer that the latter also is not a nerve bestowing sensibility. This inference, however, does not rest solely upon conjecture, the fact has been placed beyond the reach of dispute by Mr. Broughton. In the same horse which was the subject of the experiment on the portio dura, "the par vagum

* An Exposition of the Natural System of the Nerves, &c., by Charles Bell, p. 98.

† London Medical and Physical Journal, June, 1823.

was exposed in the neck on one side, and insulated from its cellular connexions, but carefully retained in its place. It was repeatedly transfixed with a pin, pinched, and slowly cut through with scissors, and not the slightest degree of sensation was manifested. When pulled out from its natural position, or squeezed by the forceps, the animal appeared to wheeze as in obstructed respiration, but exhibited nothing like the twitches and startings which peculiarly mark the production of pain in irritating sensible nerves."

Nothing further, I presume, need be said to prove that the pneumo-gastric is not a nerve of sensation; and, consequently, that it cannot be the seat of pain.

3. *Is the pneumo-gastric nerve the sole nervous agent in digestion, or do the nerves of the sympathetic system exert any considerable influence in the digestive process?*

That the pneumo-gastric nerves exert a powerful influence in digestion appears to be satisfactorily established. Haller, I believe, was the first that observed the division of these nerves to suspend digestion. This result has also been frequently observed by Dr. W. Philip, Dr. Hastings, and others. The observations of some experimentalists, however, would lead us to suppose that the same effect is not invariably produced. Le Gallois did not find that digestion was generally arrested. Mr. Brodie, I believe, divided these nerves just above the stomach, and found that digestion proceeded as usual. Magendie is said to have obtained the same result. These observations would induce a suspicion, that digestion does not solely depend upon the pneumo-gastric, and this inference does not rest merely upon supposition, but is incontrovertibly established by the fact of there being numerous animals

capable of digesting very crude substances, which have no nerve analogous to the par vagum, distributed to the stomach. Hence some other nervous agent must possess considerable influence in the digestive process, and the source of this nervous energy must necessarily be the sympathetic, and disease situated in that portion of the sympathetic which is devoted to the stomach, may consequently interfere with the due performance of digestion.

Even admitting that the part of the digestive process which consists in the due secretion of gastric juice depends upon the pneumo-gastric, it is probable that any disease affecting the muscular action of the stomach (which depends upon the sympathetic) may thereby prevent the superficial layers of digested aliment from being regularly removed so as successively to expose fresh portions to the action of the secreting surface, and almost as effectually interrupt digestion as if the secretion had never been formed.

It is also probable that even the *secretions* of the stomach are considerably dependent upon the sympathetic, for we frequently find enormous secretions of air, and also of liquid, as in pyrosis, accompanied with tenderness in that part of the spine near which the splanchnic ganglia are situated, without there being any reason to suspect the existence of disease near the origin of the pneumo-gastric nerves.

I will briefly recapitulate the inferences which appear deducible from the preceding observations.

That painful affections of the nerves of the heart, lungs, and stomach, are not seated in the filaments of the pneumo-gastric nerve, since this nerve is not a nerve of sensation, and therefore cannot be the seat of pain;

consequently that they must be seated in the filaments of the sympathetic.

That the action of the blood-vessels and muscular viscera is dependent upon the sympathetic, and consequently that irregularities in the action of these involuntary muscles may with much greater probability be referred to disease in the sympathetic than in the cerebro-spinal system.

That as digestion has been observed to take place in some instances after the division of the eighth pair, and that it proceeds in animals which have not this nerve distributed to the stomach, it is evident that some other system of nerves (the sympathetic) exerts a considerable influence in digestion, and consequently that disease in the sympathetic may disorder or interrupt the digestive process.

I must now refer to the pathological principle with which I commenced; namely, that disease of the nervous masses is not so much evinced by symptoms in the immediate seat of disease, as by phenomena exhibited in those remote parts to which the nerves arising from the diseased portion are distributed. Upon this principle those nervous diseases of the heart, lungs, and stomach, which have been shewn to be more probably dependent upon the sympathetic than upon the cerebro-spinal system of nerves, *should not be regarded as diseases of the particular filaments distributed to these organs, but as diseases of the ganglia or masses from which the filaments are derived.*

The *probability* that these diseases depend upon an affection of particular ganglia is still further corroborated by the fact that tenderness may generally be detected in that part of the spine which is contiguous

to the particular ganglia. Thus, when the heart is affected, there is tenderness in the cervical vertebræ; when the stomach is affected, the tenderness is seated in the middle or lower dorsal portion of the spine. The result of treatment directed to these parts may be still further adduced in corroboration.

In the absence of direct evidence from dissection, the precise nature of these affections of the spinal marrow and ganglia must to a certain degree remain conjectural. The collateral evidence, however, is of such a nature as to leave but little doubt of the disease being inflammatory.

Throughout this treatise, I have in general used the term irritation in preference to inflammation, supposing that to many the former would be less objectionable during the present deficiency of *post mortem* evidence. I wish, however, to be understood as using the word irritation in the same sense as many continental writers have lately employed it, regarding irritation and inflammation as morbid states, differing from each other merely in degree, and exhibiting no distinct line of demarcation.

The supposition that these diseases are inflammatory is greatly strengthened by a comparison of the symptoms which they present with those attendant upon the more severe forms of inflammation of the spinal marrow, which have proceeded to a fatal termination, and have left unequivocal traces of their existence. The symptoms of the former, on careful examination, will appear simply as slighter shades of the more severe affections. The skin, instead of being entirely deprived of feeling, has its sensibility merely perverted or impaired; and the muscles, instead of being paralysed,

are simply enfeebled or affected with tremors or spasms. And if the symptoms which mark the *commencement* of the more severe diseases of the spinal marrow be carefully observed before they have reached their advanced state of development, they will often be found precisely similar to and even identical with the signs which denote these milder forms of disease. There may also be observed every gradation of symptoms, from those which denote the mildest irritation of the spinal marrow to those which attend its complete disorganization. Hence it may be inferred that they are but slighter shades of the same disease—inflammation; which, however, may exist, as we observe in other organs, in so low a degree as to produce annoying functional disturbance without tending to actual disorganization; and seldom, unless aggravated by accidental circumstances, proceeding to a fatal termination.

It might be urged in objection that inflammation could not exist for so long a period without producing disorganization of the affected parts. I would, however, ask, Do we not in the children of the poor repeatedly observe a chronic form of inflammation of the eyelids (ophthalmia tarsi), which will continue for months or years without any disorganization or destruction of parts?

The tenderness of the spine in that particular part, which the nervous symptoms would indicate as the seat of disease, may be considered as corroborative of the inflammatory nature of the disease. It might, however, be argued that the tenderness is not confined to the exact site of the spinal marrow and its membranes, but is more diffused, being perceived over the whole extent of the affected vertebræ; or it might be urged that the

spinal marrow and its membranes are so securely protected by the vertebral column as not to be influenced by any moderate degree of pressure upon the vertebræ. To these objections I would reply that the affection most probably is not confined to the spinal marrow and its membranes, but that the surrounding tissues, as the ligaments, the cellular connecting medium, &c., are all involved in a state of phlogosis. This would account for the sensibility to pressure whenever the connecting ligaments of the vertebræ were thereby disturbed. When the symptoms would lead one to suspect that both the ganglia and the corresponding portion of the spinal marrow are affected, it is probable that the disease may have extended from one to the other through the medium of the connecting or anastomosing nervous branches. This receives support from a case related by Lobstein, which will hereafter be quoted. In this instance "there was phlogosis of the ninth and tenth thoracic ganglia, and of the *two anastomosing branches* sent from the costal nerves."

As these diseases seldom prove fatal, it rarely happens that the aid of dissection can be obtained in elucidation of their pathology; and even if opportunities for *post mortem* examinations should occur, as when death has been produced by some other cause during the existence of these diseases, it is probable that the investigation may only prove unsatisfactory in detecting any morbid appearances. But it must be recollected that, although the parts after death may not exhibit any traces of inflammation, we are not warranted in concluding that they have not recently been the seat of disease. When the conjunctiva has been intensely injected from inflammation, or the skin the seat of redness

from erysipelas, how slight are the traces of inflammation after death! And if the conjunctiva and the skin may be intensely red from acute inflammation, and yet exhibit scarcely any traces of disease after death, it is more than probable that the spinal marrow should be equally destitute of the marks of disease. Indeed, it would even be a subject for surprise if any permanent changes in this structure had been effected, since the diseases in question are presumed only to consist in the lighter shades of inflammation, seldom attaining those violent degrees of intensity which are attended with obvious disorganization.

The same train of reasoning is equally applicable to the ganglia, and it is probable that the chronic or subacute forms of inflammation in these structures may be equally unproductive of morbid appearances discoverable after death. The ganglia, however, are occasionally the seat of disease, of such intensity as to produce permanent alteration in these structures; and in some of the instances which have been recorded, the symptoms produced by these diseases were principally exhibited in the remote organs to which the nerves of the affected ganglia were distributed. The following instances of disease in the ganglia are related by Lobstein.*

"A female of regular habits had suffered from spasmodic and hypochondriacal symptoms from the age of puberty, and had twice been attacked with incomplete apoplexy, which left a slight paralysis of the right side of the face; at forty-two she was married, and became

* De Nervi Sympathetici Humani, Fabrica, Usu, et Morbis, &c. Auctore J. F. Lobstein, &c. Parisiis, 1823.

I quote these cases from the Medical and Physical Journal of March, 1824, not having been able to consult the original work.

pregnant fifteen months after. At the eighth week of utero-gestation, a train of symptoms arose which subjected the patient to great misery. She had vomiting to such an extent that, for three months, she immediately rejected every thing taken into the stomach; no relief being afforded by any internal medicine or external application. During the last seven days of her life, even a drop of water when swallowed, was refused by the stomach. The internal fauces and the mouth first became inflamed, and subsequently mortified, from the continued excitement of vomiting; and the patient's fingers in consequence of her sometimes putting them into her mouth, were ulcerated by the acrid discharge. The most distressing symptom of all, however, was a burning pain along the course of the spine, and in the lower part of the right hypochondrium, by which a constant jactitation was produced, and the strength of the patient exhausted. The only means by which this pain could be at all alleviated, was dry friction, so that the skin was quite excoriated. The unfortunate patient at last died in a state of miserable extenuation. The body was examined forty-eight hours after death. Much attention was given to the brain, but no unnatural appearances of any kind discovered. The head was thought to be rather under the usual size, but the patient had not been deficient in mental endowments. The thoracic viscera were in a state equally sound; the stomach presented no organic lesion, although there had been black vomiting; neither did the rest of the alimentary canal, nor the urinary system, differ from their healthy condition. The liver was soft and livid. The uterus, in the fifth month of pregnancy, shewed no marks of disease, except some fibrous tumours in its

substance, equalling walnuts in size. The cervix uteri was hard, perfectly closed at its external orifice, by which it had resisted the attempts made to procure abortion, and thus get rid of the vomiting by removing its cause. The fœtus was healthy and in its natural situation. The viscera were now all removed, and the semilunar ganglion cut out: it was not, indeed, converted into a foreign substance, but its colour was intensely red, which was regarded as true and genuine inflammation, by some men of experience, and great cultivators of anatomy, to whom this observation was communicated. The inflammation was so obstinate, that the ganglia were but little paler after three days infusion in cold water; and I took care to have the right ganglion drawn in this state, and represented in the seventh plate of this treatise. Its upper part is of a vivid red, but the inferior, from which the mesenteric branches go off, is more livid. The splanchnic nerve appeared to me much broader than usual, before its entry into the ganglion."

"The body of a girl was examined, who had been attacked with epidemic cough, which was converted by metastasis first into spasmodic vomiting, and then into atonic convulsions, which could not be overcome by any remedial means. In this case the left portion of the solar plexus was inflamed; the right being healthy."

"A man, aged forty-seven, had a fibro-cartilaginous tumor, which adhered loosely to the spine, cut out. In two years he returned to the hospital, having another tumor on the same site: he was seized with tetanus, and died in two days. On opening the body, were found, first, a vascular cyst well filled with blood, at the surface of the medulla spinalis, and a quantity of

serum effused within the sac formed by the dura mater; secondly, very distinct inflammation of the semilunar ganglia."

"In a boy, of ten years old, who died with symptoms of anxiety and oppression in the chest, and rattling at the pit of the stomach, in consequence of the retrocession of an exanthematous eruption, the author found a part of *the trunk of the sympathetic nerve inflamed, with phlogosis of the ninth and tenth thoracic ganglia, and of the two anastomosing branches* sent from the costal nerves."

It is too much the fashion, even in the present day, to attribute numerous neuralgic symptoms to sympathy, or to disorder of the digestive organs.

If a child be seized with convulsions from an irritating cause in the gums, stomach, or bowels, the convulsions are said to be *sympathetic* of such irritation. It is true that the irritation* alluded to may have been the primary cause of the convulsive affection, but, previous to such an effect, it must have produced some derangement in the vascular action of the brain. Of this cerebral disturbance the convulsions are, in reality, symptomatic, and not of the original irritation. The danger and impropriety of regarding the convulsions as a sympathetic affection will still further appear, when we consider, that a frequent repetition, or long continuance of the vascular disturbance of the brain, will often be followed by more permanent disease, which may continue to advance after the original irritation which produced it has been removed, and may even proceed to a fatal termination.

* Irritation is here employed to designate an *irritating cause*, and not a *morbid condition*, as in some of the preceding pages.

The same objections exist against regarding many neuralgic symptoms as dependent upon *disorder of the digestive organs.* Under this vague term are included a variety of affections of the chylopoietic viscera, which occasionally excite a disordered state in some portion of the nervous masses,* as indicated by various neuralgic symptoms; these affections of the nerves, however, must be regarded as denoting a diseased or deranged state of the nervous masses from which they are derived, and not as symptoms of the irritation in the stomach and bowels. It should also be particularly borne in mind, that this disordered vascular state of the nervous masses, which was at first temporary or transient, may, by continuance or repetition, pass into a more permanent state of disease, and may proceed as an independent affection after the primary irritation or disorder in the digestive organs, has been removed.

Another fashionable error consists in referring an assemblage of neuralgic symptoms to hysteria, which, in the imagination of many people, appears not to be a disease, but some mischievous demon, who dances along the nerves, and plays strange vagaries in his course. How frequently do we see a female, labouring under a variety of distressing symptoms, referable to the nervous system, and hear the consoling remark, "It is only a fit of hysterics." By this the minds of the anxious relatives are composed, and the medical man also sometimes calms his own fears by thinking, that, as the complaint is what is called hysteria, there can be no *actual disease.* But, I would ask, can the pupils be dilated, the senses temporarily obliterated, the whole

* Under this term I wish to include the larger masses of nervous matter, as the brain, spinal marrow, and ganglia, as distinguished from the nerves.

system of voluntary muscles thrown into spasm, without the existence of disease? No; the vascular system is seriously disturbed; the large nervous masses, as the brain, spinal marrow, and ganglia, are the seat of congestion, which, also by continuance and repetition, may so far impair the tone of the capillaries as to produce a state of actual inflammation.

With these remarks I must close the discussion of the pathology of these neuralgic affections, and for the barrenness of this part of my subject, an almost total inability to bring forward the aid of morbid anatomy, must plead my apology. Future opportunities of investigating these affections may perhaps obviate the difficulties under which I now labour.

I will proceed to relate a few cases in illustration of the diseases of the ganglia and spinal marrow. The simpler forms of the affections will be first brought forwards, afterwards those which are more complicated and extensive.

Case X.

Palpitations, Dyspnœa, Neuralgia of the Upper Extremities.

September 8th, 1828. Mrs. H——, æt. 53, complains of a violent beating of the heart and difficulty of breathing. The palpitations occur many times during the day, even when she is sitting still, but more frequently and violently after exertion. In the night she is often awoke by the violent beatings of the heart, during which she is seized with great difficulty of

breathing, sometimes so severe as to threaten suffocation; this is attended with a wheezing sound throughout the upper part of the chest, and on applying the hand to the chest a peculiar vibration can be perceived. After the dyspnœa and palpitations have continued about a quarter or half an hour, the respiration and the action of the heart are restored to a natural state. The most violent attacks are at night soon after she has retired to bed. She is also much teazed with "fluttering" sensations in the upper extremities, and frequent sudden twitchings of the muscles; she feels a stiffness on moving the neck. Her appetite is generally deficient, and she is a little disposed to indigestion. A hoarse cough without expectoration is often troublesome. She has been subject to palpitations and difficulty of breathing many years, which have varied in severity from time to time. Her complaints have been considered as hydrothorax.

There is considerable tenderness in the third, fourth, and fifth cervical vertebræ, and a slight degree in a few of the upper dorsal.

Sept. 8th. I directed leeches to be applied, and on the following evening a blister. She felt great relief immediately after the bleeding, and still more the day after the blister had been applied. On the 15th, the twitchings in the arms continued troublesome, and the palpitations were felt in a slight degree. Another blister was recommended, and on the 22d she had not perceived any of the symptoms for three or four days. On the 20th of December I was again requested to visit her, and found that her complaints had been gradually making progress for about a fortnight; the same part of the spine was tender; leeches and a blister were again

applied with most decided relief. She continued quite well until May, when she became subject to similar attacks, which were as speedily removed as before by the same treatment.

August 29th, 1829. Being in the neighbourhood where this patient resides, I called to inquire into the present state of her health. She is looking cheerful and well, and is much stouter, having gained considerable weight during the last year. The spine bears pressure without uneasiness. Since May she has had very good health, and but rarely feels any return of the palpitations or other symptoms, and that in so slight a degree as to occasion neither alarm nor inconvenience.

Case XI.

Palpitations, Neuralgia of the Arms and Scalp.

August 14th, 1828. Sarah B., æt. 17, has been five months affected with palpitations and pain in the region of the heart. The palpitations occur in violent paroxysms several times during the day; at night they are less violent, but are frequently troublesome. The pain is referred to the immediate seat of the heart, and occasionally spreads over the lungs. There is often an oppressive tightness across the upper part of the sternum; and also pain darting down the arms and over the scalp. In other respects she enjoys good health.

Great tenderness in the five upper cervical vertebræ.

Leeches to be applied, and a blister on the following night.

19th. She has been feverish for a few days, and

is still troubled with the pains and palpitations. Ordered saline mixture.

25th. Much better; palpitations continue in a slight degree, but are much relieved.

Sept. 1st. She is quite free from all the symptoms. Directed to use the turpentine liniment for a few weeks to guard against relapse.

Case XII.

Palpitations, Neuralgia of the Arm, Gastrodynia, &c.

June 25th, 1828. Harriet J., æt. 19, complains of palpitation of the heart, occasional tightness across the chest, a frequent tendency to fainting, and pain at the stomach.

The palpitations occur frequently during the day from any change of posture, as from the erect to the sitting, and the reverse. They are greatly increased by exercise, and sometimes occur, though less violently, when she is recumbent. In walking she is often obliged to stop instantaneously on account of the sudden occurrence of a painful sense of oppression, or tightness across the lower part of the sternum and epigastrium. There is pain in the muscles of the neck, and a stiffness or difficulty in moving the head and neck; pains are felt extending from the left clavicle over the left breast, which becomes highly sensible to the touch when the pains have existed a long time; pains also extend down the left arm and fore arm to the tips of the fingers; there is a feeling of weakness in the left arm, so as to cause

difficulty in holding her work in sewing. No affection of the right arm, nor of the lower extremities, except a slight feeling of weakness. Pain in the lower intercostal muscles on the right side; occasional sense of pain and distention at the stomach, which occur at intervals with great severity. Catamenia regular. Bowels torpid.

These complaints have been troublesome during the last six months, and she attributes them to having taken cold in the winter.

The four upper cervical vertebræ are extremely tender on pressure, and the fourth, eighth, ninth, and tenth dorsal are tender in a slighter degree.

As the pain at the stomach during the last few days has been unusually severe, a blister to the dorsal vertebræ is recommended, aperient medicine, and quietude.

July 2d. Pain at the stomach only occurs at intervals in a slight degree, and the flatulence after taking food. Palpitations continue, but are rather less frequent. She has not felt the sudden tightness across the chest, causing her to stop when walking. She dates the improvement from the time the blister was applied.

A blister to be applied to the cervical portion of the spine.

9th. Palpitations have only occurred once, for about an hour, during the last four days. She has no pain at the stomach, nor tightness across the chest. A little pain in the arm continues, and acidity after eating.

A mixture containing the carbonates of magnesia and soda to be taken occasionally.

16th. Feels better than she has done the last six months. Palpitations occur slightly. Ordered to apply a blister to the neck.

23d. Tightness and pain at the stomach continue relieved; palpitations ceased for a few days after the application of the blister on the sixteenth, but have since returned. There is tenderness in the second and third cervical vertebræ; the dorsal are free from pain. Eight leeches to be applied to the neck, and on the following night a blister.

30th. Feels much better, occasionally perceives the palpitations in a very slight degree.

Sept. 15th. In a few days after the last report, the palpitations entirely ceased. She now feels quite well, and has not any affection of the stomach.

Case XIII.

Dyspepsia, Pulsation in the Epigastrium, &c.

June 5th, 1828. Mrs. W. æt. 23, married, but has had no children; complains of pain in the left side of the abdomen, an oppressive weight or load at the stomach after eating, constant weariness, and extreme muscular debility. These unpleasant symptoms have affected her during the last five weeks. The pain in the left side is seated in the muscles, extends between the lowest ribs and crista of the ilium, for about five inches transversely; is a little increased on pressure; is fixed, and continues both day and night. There is a sense of constriction at the lower part of the chest, and a feeling as if a cord were tied round the waist, midway between the ensiform cartilage and umbilicus, which compels her to stoop forward. At night this corded sensation is sometimes so violent as to cause her to

raise herself into a sitting posture, with the body bent forward. After taking food, either liquid or solid, the sensation of a heavy ball or weight is felt at the stomach, and continues generally for about an hour and a half. There is almost always a distressing pulsation in the epigastrium, which never ceases entirely, but only at intervals abates in violence, and is much aggravated by the ingestion of food. Frequent vomitings occur soon after taking food, and often, when it has been swallowed, it is gradually regurgitated by mouthfuls, until the stomach is evacuated; flatulence in a slight degree, and acidity constantly attend the digestive process.

On enquiry, I find that she has aching pains in the legs, and such a feeling of weakness that the exercise of walking is attended with great difficulty and exertion; there is soreness of the skin, extending over the thighs, particularly felt on rubbing the hands over them, and prickling sensations, which principally take the course of the saphenus nerve. The toes are frequently drawn into an involuntary state of flexion, particularly at night, and she is unable to rectify them by the effort of the extensors. On examining the spine there does not appear any deviation from its natural form, but there is considerable tenderness on pressing the seventh, eighth, ninth, and tenth dorsal vertebræ; a slight degree of tenderness below, and a still slighter degree in a few of those above.

A blister to be applied over the tender vertebræ.

10th. She feels much better, and says she is "not like the same being." The blister was applied on the evening of the 6th, on the next morning the pain in the abdomen had vanished; since that time she has not

felt the pain and weight at the epigastrium, and the pulsation is greatly diminished. The food has not been regurgitated; digestion has been performed comfortably; she feels that "her food does her good." She is free from flatulence and acidity; the muscular power of the lower extremities is increased, and the prickling sensations and numbness have left her entirely.

On pressing the spine, only a slight trace of tenderness can be detected in the original situation. Ordered another blister, to guard against relapse.

16th. She considers herself perfectly recovered.

Eight months after this date, she had continued well, and had enjoyed better health than for several preceding years.

Case XIV.

Extreme Flatulence, and Neuralgia of Thoracic Parietes.

February 26th, 1828. G. S., cloth-dresser, æt. 28, complains of great distention of the stomach from flatulence, accompanied with constant eructations, pain at the stomach, and pain in the back. He is quite incapacitated from working.

The discharge of air from the stomach is unusually great; it is almost incessant, an interval of a few minutes during the day seldom occurring; at night the formation of air is a little diminished, but he is far from being released from it. He frequently sits for some hours, with the body bent forward, and the head resting upon the table, in which attitude there are continued loud discharges of air from the mouth. The pain is seated

deep in the epigastrium, is increased by long standing, is constant both day and night, but less severe in the latter, and is described as an aching sensation. Constriction and pain encircling the waist, increased by various kinds of exertion, as stooping forwards, carving meat at dinner, &c. Acidity attends the eructations, not merely after eating, but at all times. No palpitations: no affection of the extremities. Appetite good, but food generally regurgitated by mouthfuls. His complaints commenced in October last, and have gradually increased. Since the beginning of February he has been unable to attend to his employment.

The seventh and eighth dorsal vertebræ are very tender on pressure, but the rest of the spine is not in the least painful.

He first consulted a surgeon, who prescribed some medicines and a "warm plaster" to be applied over the stomach; but whilst under this treatment the complaint continued to increase. Another gentleman was afterwards consulted, and bitters and the ordinary stomachic medicines were recommended, but the disease was uninfluenced by them; lastly, he applied to an empiric, who advised dandelion tea, which he took for some time without experiencing any benefit.

February 26th. Leeches directed to be applied to the spine, and in a few days a blister; recumbency to be observed for several hours during the day; milk with flour or oatmeal to form a principal article of diet.

At the end of a week, the pain at the stomach and tightness across the epigastrium were diminished, and the eructations a little relieved. During the following month blisters were applied four times, and after each application the discharges of air decreased. He

was afterwards directed to apply a sinapism once every week.

July 2d. He has progressively improved, and the relief has been greatest during two or three days after each application of the sinapisms. The flatulence now only occurs after meals, in a slight degree, particularly when the stomach has been overloaded. He has no pain round the chest or tightness, even after walking fifteen miles. A very slight degree of tenderness can be detected in the seventh and eighth dorsal vertebræ. Another blister is recommended.

July 6th. Has not had any flatulence whatever since the last blister was applied.

In September he experienced a return of the complaint, but in a much more trifling degree, and the spine was again found tender in the same part. A seton was inserted near the tender vertebræ; in two or three weeks the disease had disappeared, but the seton was continued a few weeks longer.

August 30th, 1829. He has since continued perfectly well, and has been able to pursue his employment without further interruption.

Case XV.

Flatulence, Pyrosis, Neuralgia of Thoracic Parietes.

June 11th, 1828. Mrs. B., æt. 64, an emaciated old woman, complains of being greatly annoyed by discharges of air from the stomach. She has pain across the epigastrium, resembling cramp, increased at intervals, and when it abates a little, is replaced by a sense of soreness

in the region of the stomach ; corded sensation round the waist; sudden and copious discharges of air from the stomach, occurring frequently during the course of twenty-four hours, and sometimes continuing for an hour at a time ; pyrosis in a great degree. No affection of the extremities. She has suffered from these symptoms for several months, but in a more violent degree during the last fortnight. Great tenderness on pressing the fourth, fifth, seventh, and lower dorsal vertebræ. Four days ago she applied a blister to the epigastrium, but without the slightest relief, indeed she considered the symptoms were aggravated by it.

Apply a blister to the lower dorsal vertebræ.

19th. The corded sensation and pyrosis ceased during the application of the blister ; the attacks of flatulence and distention are much reduced in frequency, violence, and duration. There is a little tenderness in the fifth dorsal vertebra ; the lower part of the spine cannot be examined, as the skin remains painful from the blister.

Six leeches to be applied near the fifth dorsal vertebra.

On the 24th, the flatulence caused very slight inconvenience, and on the 2d of July she considered herself quite well.

Case XVI.

Flatulence, &c.

June 26th, 1828. Mrs. W., æt. 22, says she is "weak and nervous, and scarcely able to attend to the duties of her family ;" she also complains of pain in the muscles of the back and loins, and of extreme flatulence.

The eructations consist of discharges of small quantities of tasteless air, at intervals of five or ten minutes, both day and night. The formation of air on the stomach is greatly increased by exercise, particularly by walking; it is also much increased by taking food. This affection is accompanied by a constant sense of distention at the stomach, which is partially relieved whenever a small quantity of air has been discharged, but returns to its former state in a few minutes. No pain in the epigastrium; pain along the cartilages of the ribs, increased on pressure, particularly on the right side. Appetite defective; bowels regular. No affection of the extremities, or palpitations. The symptoms have gradually increased for the last eight months, during which time she has become considerably emaciated.

Pain on pressing the seventh, eighth, and ninth dorsal vertebræ; no tenderness in any other part of the spine. On pressing these vertebræ the stomach becomes suddenly distended with air.

Blister to the tender portion of the spine.

28th. Flatulence and pain greatly diminished. The blister continues painful.

July 4th. No flatulence or pain for the last two days; her strength and spirits are improved, and she says she is quite well.

Case XVII.

Flatulence, &c.

June 16th, 1828. Mr. P., æt. 24, complains of nervousness, oppression at the chest, and flatulence. The flatulence consists of frequent copious eructations of air,

preceded by a sense of fulness at the chest. Pains are frequently felt in the parietes of the abdomen above the ilia, appetite good, bowels regular, slight tenderness on pressing the seventh dorsal vertebra.

Leeches to be applied to the painful part.

18th. Much better; has lost the feeling of nervousness, the oppression at the chest only occurs in a slight degree when air is formed in the stomach, which is much diminished.

21st. He has been exerting himself too violently, and finds a little increase of the flatulence and uneasiness across the chest; but no tenderness can be detected in the spine. Ordered a blister.

28th. Has not had any flatulence or pain since the blister was applied.

Case XVIII.

Palpitations, Flatulence, Neuralgia of the Upper and Lower Extremities, and of the Thoracic Parietes.

May 20th, 1826. Eliz. F., æt. 16, became a patient of mine at the Dispensary, on account of a painful affection of the left knee; she complained of many disordered feelings in other parts of the body. She suffered also from pain in the lower part of the back, and could not bear pressure on the vertebræ. The following is a statement of her symptoms:—

Great muscular debility and nervousness; palpitations of the heart, occurring on the average about three times a day, and continuing about an hour, occasionally in a slighter degree in the night; distention of the stomach; copious and long continued eructations; regurgitation of

undigested food an hour or two after eating; a distressing tightness around the waist impeding respiration, which varies in violence, but is never entirely absent; pain in the lower intercostal muscles on the left side, and occasional pains extending from the loins across the lower part of the abdomen. Numbness of both arms from the shoulders to the wrists, in such a degree that pinching can scarcely be felt; prickling sensations in the fingers, and also in the benumbed parts of the arms; loss of muscular power in the arms, so as to disable her from sewing, or lifting any considerable weights; inability to perform complete extension of the elbows, as if from slight contraction of the biceps. Similar muscular debility of the lower extremities; pain darting down the right leg along the anterior surface of the tibia; a more fixed pain in the left knee, at intervals greatly increased in severity, and attended with slight tumidity and sense of soreness on rubbing the skin; numbness in both thighs; dull pain in the occipital region, and occasional acute pain darting over the scalp; vertigo frequently occurring in a great degree. A slight febrile state is occasionally present. No cough. Menstruation regular. Bowels torpid. The whole spinal column is tender on pressure; some parts being more particularly so than others. Since the age of eleven years she has been a weak and delicate girl, and has suffered more or less severely from these symptoms since that time.

This case remained under treatment longer than usual, and was more obstinate than the generality. I will not give a lengthened detail of the particular steps of the treatment, but will confine myself to a brief summary. Recumbency was maintained either in bed or on a couch for sixteen weeks, at the end of which time she was perfectly

recovered, and was able to take an active share in domestic duties. Leeches, cupping, and blisters were frequently applied, generally at intervals of a week or ten days; towards the end of her confinement the turpentine liniment was substituted for the more painful remedies; a proper attention was paid to the regular action of the bowels; and a mixed diet of farinaceous vegetables and liquid animal matter was adopted. She now speaks most decidedly of the benefit derived from each application of the remedies to the spine, and I may remark that they were generally repeated at her own request. The affection of the heart and upper extremities speedily yielded, and she was soon able to amuse herself with sewing during her recumbency. The disorder of the stomach, constriction round the waist, and pain in the knee were more obstinate, but gradually yielded to the treatment. At the end of this time the spine would bear pressure without any inconvenience. She continued well until December, 1827, when she became troubled with a nearly similar train of symptoms, with tenderness in the spine, and her complaints increased in a few weeks to such a degree as to render confinement necessary. The same treatment was adopted during a recumbency of fourteen weeks with complete success. Since that date until the present, (September 2, 1829,) she has felt slight returns about three times, which have yielded to the use of cupping or a blister in two or three days.

Case XIX.

Palpitations, affection of the Stomach, Leucorrhœa, &c.

May 19th, 1827. Miss H——, æt. 22, complains of pain and oppression at the stomach, vomitings, pain in the head, palpitations, and general debility.

On more particular inquiry I find she is subject to frequent vomitings, especially after eating; painful oppression and tightness across the epigastrium, increased by taking food, and slightly though not entirely relieved by vomiting; pain in the left side between the seventh and eighth ribs; tightness across the upper part of the chest; attacks of palpitations which continue for a few minutes, and recur after short intervals both day and night, but more violently towards evening and in the early part of the night; when the attack of palpitations has been more violent than usual, the interval is rather longer; the palpitations are always accompanied with dyspnœa and a wheezing sensation which is perceptible on applying the hand over the upper part of the chest. She also suffers from a frequent loud cough unattended with expectoration; a constant tickling sensation in the throat, a little above the upper part of the sternum; aching pains in the elbows and shoulders; prickling sensations at the tips of the fingers; aching pain at the upper part of the neck, and in the occipital region; acute darting pains in both temples, varying in intensity, and attended with violent throbbings; vertigo on suddenly moving the head, or on directing the attention to anything; fixed pain in the abdominal muscles on each side; aching in the loins; pain in the bladder both before and after

evacuation, and frequent inclination to pass urine; profuse leucorrhœa; pain in the thighs and knees; occasional prickling sensations in the legs; frequent cramp in the calves of the legs; shiverings, and sensation of cold water trickling down the back; catamenia regular, but attended with pain; bowels regular.

Her complaints undergo considerable aggravation in the evening and in the early part of the night; the exacerbations occur even if she be entirely recumbent.

She has not enjoyed good health for many years; but has been more severely afflicted during the last fourteen weeks. Has been habitually subject to leucorrhœa for upwards of five years, and has been more or less troubled with the palpitations and disorder of the stomach during that time. She has undergone a great variety of medical treatment.

The spine is tender throughout its whole extent, but more particularly at the second and third cervical vertebræ, from the fifth to the tenth dorsal, and at the two lower lumbar vertebræ and sacrum.

Recumbency, and the abstraction of blood from the neighbourhood of the spine by cupping were recommended. She was confined to bed five weeks, during which time the most tender parts of the spine were cupped three times, and the turpentine liniment was used night and morning. After the first operation she felt greatly relieved both of the palpitations and vomiting, and was able to sleep comfortably, although for a length of time she had been subject to watchfulness, and had not been able to procure repose even from opiates, which had previously been freely administered. After each succeeding abstraction of blood by cupping, most decided improvement was experienced, and at the

end of five weeks she was so far recovered as to leave her bed, but occasionally reclined upon the sofa when she felt weary. She also persevered in the use of the turpentine for a few weeks longer, after which she perfectly regained her health, and became active and strong. The palpitations, pains, and affections of the stomach entirely disappeared; and what must be particularly noticed is that she became quite free from leucorrhœa. She continued well until June, 1829, when I was again consulted on account of a recurrence of her complaints, more particularly of the palpitations and leucorrhœa; she remained under treatment about a month, but was only recumbent a week; leeches were applied twice, and a blister three times to the spine, after which she perfectly recovered. I have seen her this day (September 4th, 1829); she is looking well, and is free from all unpleasant symptoms. She has no leucorrhœal discharge.

ANGINA PECTORIS.

The disease to which Dr. Heberden assigned the name of Angina Pectoris* in the year 1772, has, since that time, remained in considerable uncertainty, as to its symptoms, pathology, and treatment. The most prominent symptom by which it is characterised, and from which it derives its name, is the peculiar constriction, anguish, pain, or oppression, which is experienced in the epigastrium or lower part of the chest. To this several other symptoms are added, but authors are far from being agreed as to those which peculiarly characterise the complaint.

In describing this affection in its commencement, Dr. Heberden says, "Those who are afflicted with it are seized, while they are walking, and more particularly when they walk soon after eating, with a painful and most disagreeable sensation in the breast, which seems as if it would take their life away, if it were to increase or to continue: the moment they stand still, all this uneasiness vanishes. In all other respects the patients are, at the beginning of the disorder, perfectly well, and in particular have no shortness of breath, from which it is totally different." "The os sterni is usually pointed at

* Med. Trans. vol. ii. art. 6.

as the seat of the malady, but it seems sometimes as if it were under the lower part of it, and at others under the middle or upper part, but always inclining more to the left side; and sometimes there is joined with it a pain about the middle of the left arm. What the particular mischief is, which is referred to these different parts of the sternum, it is not easy to guess, and I have had no opportunity of knowing with certainty. It may be cramp, or an ulcer, or possibly both."—p. 64.

In addition to the symptoms enumerated by Dr. Heberden, Dr. Wall* mentions the following as attending all the cases which he had seen. "The pain under the sternum constantly extended itself on each side across the breast in the direction of the pectoral muscle, and affected one or commonly both arms, exactly in the place where the muscle is inserted into the os humeri." p. 13.

In the case of R. M., Esq., related by Dr. Fothergill:† the sensation at the chest is described as "a sort of stricture surrounding the chest, principally in a line with the mammæ, in such a manner as to render it impossible to take a step further without the hazard of immediate suffocation. A sharp pungent pain most particularly affecting the parts under the left breast, extending itself upwards on that side, and down the inner part of the left arm to the elbow," p. 236. These symptoms were frequently terminated by eructations.

In the case of J. Simpkins, related by Dr. Johnstone,‡ the patient "complained of sharp pain under the middle of the sternum upon quick motion, and especially on

* Medical Trans., vol. iii. art. 2.

† Medical Observations and Inquiries, vol. v. art. 21.

‡ Memoirs of Medical Society of London, vol. i. art 22.

going up hill, which gradually extended internally through the breast, on each side down the arm to the wrists (where he had a sensation similar to that occasioned by an electrical shock, or as if it was breaking) and so out of the ends of the fingers, attended with violent palpitations of the heart and difficult respiration," p. 307.

In Dr. Johnstone's* second case, the attack was preceded and accompanied by pain in the stomach, flatulence and indigestion.

Dr. Butter† considers that difficulty of breathing may attend both the paroxysms and the intervals.—That between the paroxysms, the patient is affected with bad digestion.—That the paroxysms are generally attended with flatulence; and that relief is often obtained from eructations.

An interesting case is related by Dr. Black, in the fourth volume of the memoirs of the Medical Society.‡ His patient, whilst walking up an acclivity, found a sudden pain strike him a little below the left mamma, which was accompanied with a sense of anxiety and oppression in the chest: these attacks were easily produced by walking after dinner or in the evening, and were "always accompanied with what he called a numbing though severe pain diffusing itself from the left side of the thorax towards the shoulder and thence down the arm, terminating at the insertion of the deltoid muscle." Afterwards were added to these symtoms "a most severe dyspnœa and intolerable sense of anguish at the heart, resembling that which is felt by a person exhausted and ready to faint from running, and

* Memoirs of Med. Society, vol. i. art. 31.

† Treatise on Angina Pectoris by W. Butter, M. D., London, 1791.

‡ Memoirs of Med. Society, vol. iv. art. 20.

a sensation which the patient compared to that which would be excited by a lump of hard bread, not sufficiently chewed, sticking in the lower part of the œsophagus. The paroxysm usually attacked about two o'clock in the morning, and always during sleep. The symptoms gradually increased in violence for an hour nearly. They then began to decline, and in about another hour they totally ceased. In one or two paroxysms of unusual severity the right arm was affected with a pain similar to that above described in the left."

In the year 1799 the attention of medical men was more particularly directed to this disease by the valuable publication of Dr. Parry.* He does not, however, allow the same latitude to the symptoms as preceding authors have done. Dyspnœa and palpitations he excludes from the catalogue, and does not consider any case as a true specimen of the disease in which those symptoms occur. In the first case related by Dr. Parry, which was communicated to him by his friend Mr. Paytherus, the patient was attacked soon after retiring to rest, with a violent pain in the chest, darting through from the sternum to the spine, accompanied with a sense of stricture, difficulty of breathing, sickness and vomiting; a weak irregular pulse, pale countenance, and cold, but profuse perspiration. The going off of the paroxysms was preceded by loud and frequent eructations. As the disease advanced he complained of pain in the left arm, afterwards in both; at length his hands and fingers became affected to so great a degree, that the power of moving them was sometimes suspended

* An Inquiry into the Symptoms and Causes of the Syncope, Anginosa, &c., by Caleb Hillier Parry, M.D. London, 1799.

during the attack. The paroxysms gradually became more severe, and the remissions less perfect; œdema supervened, and life was terminated suddenly.

In Dr. Parry's second case the patient at first began "to complain of some pain across the left breast, stretching along the inside of the left arm, which he said was in some measure alleviated by breaking wind upwards;" the pain afterwards stretched into the fingers of the left hand.

The fourth case is a well marked example of the disease, from which I shall quote rather freely, as I am desirous of enumerating the symptoms in the same words as they have been related by different writers. Mr. M., æt. 77, returned from the East Indies to Europe, "in consequence of violent pains about the breast, which he was supposed to have contracted from much stooping to write." "On his return to England he led a very sedentary life; and, after the lapse of a few years, became subject to indigestion and flatulency." "But the malady to which he was more especially liable was occasional paroxysms of violent pain, attacking successively, but irregularly as to period, duration, and order, his head, breast, back, shoulders, elbows, wrists, hands, and knees, attended with a sensation of great heat in the parts affected, and much soreness of the limbs, after he had long suffered, but totally unaccompanied with swelling, or any other mark of inflammation." "In addition to the pains which I have described, Mr. M. was subject to cramps in the muscles of the legs, and to a great and indescribable uneasiness and distention about the stomach and lower part of the ribs, more especially after eating. This

latter symptom was attended with a sense of coldness striking through to the back, and was relieved by eructations. Mr. M. was never affected with palpitations of the heart, and was in general free from all cough or difficulty of breathing from exertion or lying down, but, for some years previously to his death, he had now and then complained of a little tightness across the chest." He did not complain of the pain in either arm or in the upper part of the chest, as is generally observed in these cases.

Dr. Parry considers the case of J. Simpkins, related in the first volume of Medical Memoirs, in which *palpitations* occurred, but where the other symptoms corresponded with those of angina pectoris, "to have been mistaken" for a case of the latter disease. In another place, he remarks, "the worst state of angina pectoris is unaccompanied with any difficulty of breathing."

In the London Medical and Physical Journal for 1800, a case is related by Dr. Cappe. The patient suffered from "fits of gasping for breath," had an inexpressible sensation of severe pinching at the pit of the stomach; after the fit he experienced a sense of fluttering at the heart; he never had pain in the arms.

In 1809, Mr. Burns's work on the Heart appeared, in which he fully adopts the opinions of Dr. Parry respecting the characteristic symptoms of this disease; and he considers, that if palpitation be present, it is not the genuine disease, or that it is "complicated with other affections of the heart."

In the sixteenth volume of the London Medical and Physical Journal, a case of angina pectoris is related by Mr. Weldon, in which *palpitations* were present.

In 1813 Dr. Blackall published his work on Dropsies, in the appendix of which are related several very interesting cases of angina pectoris.

In the first case there was "pain at the lower part of the sternum, extending over the breast, and down the arms to the tips of the fingers, together with *great oppression of breathing.*"

Wm. Duffell, the subject of the second case, was affected with severe attacks of pain in the region of the heart, attended by most dreadful anxiety and sense of faintness. The pain was brought on by the slightest exercise, and obliged him to remain perfectly still for some minutes, when it moved towards the left shoulder and clavicle, but never down either arm. Eructations always accompanied, and, in some degree, relieved it.

In the third case the patient experienced attacks of pain at the pit of the stomach, which after a few minutes passed off between the shoulders and down both arms to the elbows. "The nightly paroxysms were generally foretold by *palpitations.*" He was perfectly free from dyspnœa.

The fourth case was attended with pain in the region of the heart; *palpitations;* pain at the shoulders and down both arms; difficulty of breathing during the paroxysms; and pyrosis.

In the fifth case there was pain in the region of the heart, spreading rapidly to the left arm, with faintness and inability of movement; frequent tendency to deliquium, and great anxiety.

In commenting upon the symptoms, Dr. Blackall considers that palpitations frequently co-exist with this disease.

I cannot better conclude these quotations respecting

the symptoms of angina pectoris, than by relating the concise description of the disease which is given by Laennec.

"The attack commences with a sense of pain, pressure, or constriction in the cardiac region, or at the end of the sternum. There is, at the same time, a numbness, occasionally attended with pain in the left arm, rarely in both arms, or in one half of the body; more rarely still in the right arm only; and sometimes in all the limbs. The painful sensation is particularly felt on the inner side of the arm, as low as the elbow; and sometimes, as already mentioned, it shoots still further down. It is not unusual for the patient to suffer, at the same time, from pains over the fore part of the left side of the chest; and in the female these sometimes so affect the mammæ, that the slightest pressure becomes painful. Sometimes, particularly when the paroxysm is severe but short, the patient feels as if the same parts were pierced by iron nails or the claws of an animal. There are also pains in different points of the chest, dyspnœa, (in extreme cases suffocative orthopnœa,) violent palpitations, congestion of blood in the head, and sometimes syncope or convulsions; when the attack is over, the patient merely retains a slight feeling of these various symptoms, particularly the numbness of the limbs, the left more especially."

On reviewing the symptoms of this disease, as they are related by different authors, it is evident that they are subject to great variation; and that the disease is not confined to any particular set of symptoms, but that various groups of morbid phænomena may be included within its range. The most essential symptom is the sense of stricture or oppression at the epigastrium, to

which is generally added flatulence and eructations; most frequently there also co-exists pain in the chest and arms, particularly on the left side, and not unfrequently palpitations or dyspnœa.

With respect to the pathology of angina pectoris, the greater number of writers, particularly those of earlier date, consider the symptoms to be produced by some morbid condition of the heart, more especially ossification of the coronary arteries, whereby its muscular powers are impaired, and it is rendered incapable of freely propelling the blood which it receives. This opinion was principally advocated by Dr. Parry, who found that ossification of the coronary arteries, or of the valves of the heart, or softening of the muscular structure of this organ, existed in almost all those fatal cases in which dissection had been practised, either by himself or by those who had previously written on the subject. This opinion was also confirmed by various subsequent writers; Burns fully coincides with Dr. Parry, and Dr. Blackall also attributes the disease, at least in the advanced stages, to some organic change in the heart or large vessels.

These conclusions, however, have not received confirmation from more recent investigations. Numerous cases have occurred, presenting the characteristic signs of angina pectoris, in which a perfect recovery has taken place, which could scarcely have been possible if any considerable organic change had existed in the structure of the heart. Many other cases of angina, which have proved fatal, and have been inspected after death, have not exhibited any traces of diseased structure in that organ; and repeated instances of ossification of the coronary arteries have been met with, in which the symp-

toms of angina were not present. From these circumstances, we must conclude that the organic changes in the structure of the heart are not essential to the disease, and that although they frequently co-exist with angina, yet they are not the cause of those symptoms to which that name has been assigned. We must then look to some other source for the explanation of the phenomena.

In the various writings on the subject, there are occasional surmises found relative to some portions of the nervous system being affected; but this appears to have been considered more as an accidental or collateral circumstance, the affection of the heart being regarded as the principal disease; and the only practical inferences which were deduced from these surmises respecting the nerves, consisted in the employment of certain remedies which were formerly termed nervous, or antispasmodic. I think it necessary, however, to quote some of those remarks which have been made relative to the nerves, as they will tend materially to identify the cases which have been quoted with those which I shall hereafter adduce.

In the third volume of the Medical Transactions, Dr. Wall* observes, "It may be difficult to account for the symptoms above taken notice of, when the pectoral muscle is so particularly affected; but this appears to be merely spasmodic, and to arise from an irritation of the nerves of the thorax and heart. It may throw some light on this affair to consider that the nervi intercostales, or sympathetic, distribute many branches to the heart, arteriæ pulmonales, and aorta; the other branches

* Dr. Wall, Med. Trans. vol. iii. art. 2.

of the same nerves surround the subclavian arteries and veins, and communicate with the cervicales, which latter terminate in the insertion of the deltoid muscles into the os humeri, which is precisely the place affected by the spasm already mentioned."

Dr. Fothergill* remarks, " from the description of the pain, its course, which was across the breast, and down both arms to the elbows, I could not forbear suspecting that the sixth pair of nerves and their numerous connexions, were the seat of this disease. That some irritating cause, excited by motion, affected them, and that the parts they were principally distributed to, suffered in consequence."—p 242.

In the case of the Rev. Gregory P——y, related by Dr. Johnstone,† are the following remarks. " It is in this state (in which the heart from any disease is hindered in freely distributing the blood, &c.) so immediately threatening to life, in this convulsive and agonizing struggle for existence, that the cardiac nerves, derived from the thoracic (cervical) ganglions of the great sympathetic nerves, are stimulated in an extraordinary manner indeed, and that all the wide extended connexions of the sympathetic nerves, particularly those in the chest and upper extremities, are irritated thereby into painful spasms, such as are felt in the angina pectoris, though least of all in the organ from which they originate, the heart itself."—p. 38.

In Dr. Butter's‡ treatise, the following observation occurs, " the course of this pain along the neck and shoulders, and down the arms, arises from the near

* Dr. Fothergill, Med. Obs. and Inq. vol. v. art. 21. 1776.

† Memoirs of Medical Society, vol. i. art. 31.

‡ Treatise on Angina Pectoris, by William Butter, M.D. 1791.

connexion that subsists between the diaphragmatic and brachial nerves."—p. 47.

Dr. Blackall* makes the following observation, "Is it not probable that the appearances here and in other cases on dissection, shew only the effects of the disease, and that the attack was at first no organic or inflammatory affection of the vessels near the heart, but partook of the nature of spasm?" "We know that spasm exists at times in all the muscles which carry on the vital and involuntary functions."—p. 361.

M. Desportes,† in an essay published in 1813, advances an opinion, that angina pectoris has its seat in the pneumo-gastric nerve.

Laennec‡ assigns to the complaint a seat in the nerves, but is of opinion that the particular nerves in which it is seated may vary. "When," says he, "there exist at the same time painful sensations both in the heart and lungs, it is right to consider the pneumo-gastric nerve as the principal seat of the affection; when, on the contrary, there is merely a sense of oppression at the heart, without any pain in the lungs, or difficulty in respiration, one would rather suppose the seat of the complaint to be in the filaments which the heart receives from the great sympathetic. Other nerves are sometimes affected at the same time, either from sympathy, or from their anastomosis with those which are the chief seat of the affection. The nerves derived from the brachial plexus, and particularly the cubital nerve, are almost always affected; frequently also the anterior thoracic branches which arise from the superficial cer-

* Observations on the Nature and Cure of Dropsies, &c. by J. Blackall, M.D. Exeter, 1813.

† De l'Angine de Poitrine. Paris, 1813.

‡ Traité de l'Auscultation Mediate, &c. Second Edition.

vical plexus, and occasionally the nerves from the lumbar and sacral plexus, since the thigh and leg in some cases partake of the numbness and pain."—p. 748.

I am fully convinced that it is to the nervous system we must look for the seat of this disease; but the great error, which has been committed by those who have assigned to angina pectoris a seat in the nerves, consists in their having overlooked the pathological fact, to which I formerly alluded, namely, that when any of the nervous masses, as the brain, spinal marrow, or ganglia, are the seat of disease, the morbid phenomena are not so much exhibited in the masses themselves as in the parts to which the nerves arising from them are distributed. Thus Laennec, whose views are by far the most definite of any that have been quoted, expressly states that he considers the seat of the disease to be in the pneumo-gastric nerve, or in the *filaments* of the great sympathetic, "dans les *filets* que le cœur reçoit du grand sympatique." The treatment has also been conducted with reference to such pathological views; blisters, issues, and other remedies have been applied by the earlier writers to the neighbourhood of the heart or stomach; most frequently, however, without much benefit; and Laennec has recommended magnetism, for which purpose he employed two strongly magnetized plates of steel, of a line in thickness, of an oval form, and slightly bent to the form of the chest; one of the plates he applied to the left præcordial region, the other to the opposite part of the back, so that the magnetic current might traverse *the affected part;* and when the magnet gave but little relief, he applied a blister under the *anterior* plate. Hence it is evident that his pathological and therapeutic views extended only to the

nervous filaments; or, what amounts to the same thing, to the parts which were the immediate seat of pain, oppression, or morbid sensibility.

On the contrary I think it would be much more consistent with actual facts, if we were to consider these local affections of the nerves merely as symptomatic of disease in the nervous masses from which they are derived; and to refer the morbid affections of the spinal nerves to disease in those portions of the spinal marrow whence they originate, and the morbid train of symptoms dependent upon the ganglionic nerves to the ganglia from which they are derived.

Upon this principle the constriction or oppression at the lower part of the thorax or epigastrium, the tightness round the waist, the pains in the lower intercostal and in the abdominal muscles, should be referred to disease of the lower dorsal portion of the spinal marrow.

The pain in the stomach, flatulence, pyrosis, &c., to disease of the lower thoracic ganglia of the sympathetic.

The pains, numbness, weakness, and the morbid sensations in the neck, breast, and upper extremities, to an affection of the cervical portion of the spinal marrow.

And the palpitations of the heart, and painful affections of the heart and lungs, to the cervical ganglia of the sympathetic.

On referring to the various cases of angina pectoris which have been recorded, we find that the disease, in its simplest form, consists in the affection of the lower dorsal portion of the spinal marrow, attended with constriction and tightness across the epigastrium; to this is most frequently added an affection of the corresponding thoracic ganglia of the sympathetic from which the great splanchnic nerves are derived, producing disten-

tion, flatulence, and pain in the stomach; frequently there also exists an affection of the cervical portion of the spinal marrow, causing the pains, and other morbid sensations, in the neck, breast, and upper extremities, particularly on the left side, and perhaps occasionally dyspnœa from impaired action of the diaphragm; and not unfrequently there exists a similar affection of the cervical ganglia of the sympathetic, producing, in addition to the former symptoms, palpitations and painful affections of the heart and lungs.

This inflammatory affection of certain portions of the ganglionic system, and of the spinal marrow, is not unfrequently accompanied by various organic diseases of the heart itself, as ossification of the coronary arteries, of the valves, or of the aorta; softening, hypertrophy, or dilatation; producing, in addition to the symptoms peculiar to disease of the ganglia and spinal marrow, additional symptoms, peculiar to disease of the heart itself, as the more severe forms of palpitations, intermittent pulsations, obstructed circulation, and consequent lividity, anasarca, &c. From this combination we may easily comprehend why these affections so often prove suddenly fatal, and why organic diseases of the heart are so generally, though not universally, found on the dissection of those subjects who have died of angina, since the disease seldom proves fatal, unless accompanied with some organic disease of the heart. It is also possible, and even probable that the disordered state of the nerves of the heart, from an affection of the cervical ganglia, may predispose to the organic changes in that organ which have been so frequently observed.

The paroxysmal exacerbations of the complaint depend upon undue accumulations of blood in the heart,

which render it incapable of acting with sufficient energy to propel the blood with freedom, particularly when its muscular structure is in a state of atony, or atrophy, from ossification of the coronary arteries, fatty degenerescence, or softening; or when there exists any obstruction at the different apertures. And it is not improbable that, when the nerves of the heart are simply affected from disease of the ganglia and a consequent state of nervous palpitation without organic disease of the heart exists, that the muscular structure may be so weak and irritable as to be unable to act with that regularity and decision which is necessary for maintaining a regular and equable transmission of the blood. The causes which excite these paroxysms are such as accelerate the circulation or determine the blood more rapidly to the heart than it has the power of transmitting; as passions of the mind, exercise, and that state of the system which of late has been termed congestion, in which the blood ceases to circulate freely in the superficial parts of the body and in the extremities, and is accumulated in some of the internal organs; a state attended with coldness and pallor of the surface, and oppressed functions of those organs which are more particularly the seat of the congestion. From any of these causes blood may be accumulated in the heart and large vessels, and, when the muscular apparatus of this organ is impaired by any alteration of structure or by disease of its nerves, it may be unable, at least for a time, to restore an equable state of the circulation; a sense of anxiety, of pain, or of fulness in the region of the heart, and an impression that life is actually on the point of being suspended, is the result. In this state, after ineffectual efforts to propel

its contents, the heart, as it were, feels its inability, and sometimes yields to a temporary paralysis or syncope, and, not unfrequently, its tone is so completely overpowered, that it remains for ever paralysed.

The earlier writers applied the term angina pectoris only to the more severe forms of the affection, from which arose the opinion that it was a disease of extreme danger. Daily observation, however, abundantly testifies that it may exist in every degree of violence, from the slightest sense of oppression and flatulence to the inexpressible anxiety, constriction, and suffocation, which mark the more aggravated forms of the disease, particularly when they are combined with an organic affection of the heart. On this subject I am glad to find my views correspond with those of Laennec, who considers that in a slight degree it is a disease of very frequent occurrence.

I have been induced to refer the various groups of symptoms which have been described as angina pectoris, to an affection of some portion or portions of the spinal marrow, and of the corresponding ganglia of the sympathetic, by the following considerations.

1. The fact, as I have before observed, that most of the morbid phenomena exhibited in the extreme filaments of nerves, are seldom owing to disease in the nerves themselves, but to an affection of the nervous mass from which they are derived.

2. The co-existence of pain on pressing some portion of the spine with the symptoms constituting angina pectoris; and the correspondence of the painful part of the spine with the particular symptoms which are present; namely, tenderness in the lower dorsal portion of the spine in conjunction with the stomach

affection, constriction, &c. and tenderness in the cervical spine, with pains in the arms, breast, and shoulders, and palpitations.

3. The relief obtained by local antiphlogistic measures to the spine; for instance, to the lower dorsal portion when the stomach is affected, and there is constriction, and to the cervical portion when there is an affection of the arms and palpitations.

Case XX.

Angina Pectoris, Neuralgia of the Left Arm, Flatulence, &c.

December 13th, 1827. I was requested to attend Mrs. L., æt. 72, a lady of delicate appearance, who has many years been afflicted with gout.

She now requires medical assistance on account of frequent attacks of oppression at the chest, attended with many distressing symptoms. The paroxysms commence with an indescribable sense of tightness across the thorax situated about the lower portion of the sternum, accompanied by pains extending from the neck over the left breast and down the left arm. Near the elbow the pain is very severe; below this part there is not any pain, but a sensation of itching, tingling, and prickling. The pain in the arm is sometimes so severe, that she grasps it with the right hand, from which she finds a little relief. The right arm is free from uneasiness, except a slight tingling; she has no palpitations, but has pulsation in the epigastrium. A sensation of globus is sometimes felt, which produces a sense of

suffocation, and a temporary loss of speech. The attacks are attended with coldness of the feet and legs, pallor of the countenance, and a feeble oppressed pulse. After this state has continued from one to two hours, the oppression and pains begin to be alleviated by loud and continued discharges of air from the stomach: large quantities of air are often discharged in succession for an hour. Afterwards, the oppression in a great measure disappears, the pains in the arm abate, the warmth of the extremities returns, and she feels tolerably well, a sense of numbness remaining in the left arm and breast.

During the intervals, she experiences weakness of the left arm, and frequent prickling sensations; a continued sense of a weight at the stomach is also very oppressive.

Mrs. L. has been subject to this disease about twenty-seven years. At the age of forty-three she ceased to menstruate; in about two years afterwards the attacks first occurred. They generally came on about three times a day, and during the first year they were slight, but she seldom was a day entirely free from them; the digestion was weak, and a little food not very digestible, or over-exertion, would induce a paroxysm. Afterwards, for several years, she had longer intervals of ease, but the returns were more severe, and, during the last ten years, the complaint has greatly increased, both in violence and frequency. She has now an attack generally, both in the morning and evening.

On examining the spine in the absence of the paroxysm, the second and third cervical, and the eighth, ninth, and tenth dorsal vertebræ are exquisitely sensible to pressure, and the intermediate portion is slightly tender.

Directions are given to restore the warmth of the body, and thereby relieve the congestion, by the application of heat externally, during the attack. A long blister to be applied to the spine, so as to cover the tender portions, and a dose of aperient medicine to be taken when the bowels require it; recumbency is also advised.

14th. Has passed an uneasy night, from the blister, and is rather feverish. She says, that during the application of the blister she felt the weight at the stomach and the fixed pain in the arms to abate. She continues to feel darting pains about the left breast and arm.

16th. The blister has produced violent inflammation in the skin, and considerable fever. The darting pains have been rather more severe. A poultice to be applied to the blistered surface; a dose of aperient medicine to be taken, and occasionally an effervescent draught.

19th. Much better: pulse natural, tongue clean, and skin free from unnatural heat. The pains have much diminished; but last evening she felt a threatening of the paroxysm, became rather cold, and perceived some little oppression about the sternum. Blister less inflamed, and healing.

23rd. Has sat up a little for the last three days; felt slight tendency to the attacks in the afternoons; but they appear to become gradually weaker.

26th. She feels quite free from any constriction across the chest; the pains at the stomach, breast, and arms, have disappeared; a slight prickling sensation in the fingers only remains.

29th. I took leave, as she considered herself quite well.

June 21st, 1828. Having occasion to be at the house,

I made inquiry respecting Mrs. L.'s health. Since the last report she has had slight returns of the oppression at the chest, and other attendant symptoms, on the average about once in two or three weeks; they have, however, been so inconsiderable as to excite scarcely any inconvenience or alarm; she has only once perceived the sensation of globus; has not felt the pain in the arm during the last four months; the flatulence occurs occasionally in a trifling degree. The spine bears pressure without uneasiness, except in a slight degree at the eighth and ninth dorsal vertebræ.

Case XXI.

Angina, Neuralgia of the Left Arm, Palpitations, Dyspepsia, &c.

June 30th, 1828. Mrs. Y., æt. 30, mother of four children, and of healthy appearance, complains of severe attacks of illness occurring regularly every evening. They commence with an aching sensation and tightness across the middle of the sternum, great difficulty of breathing, dull heavy pain in the left arm and shoulder, apparently proceeding from the painful part of the sternum, pains darting from the neck into the neighbourhood of the left ear. No pain in the right arm. The paroxysms occur every evening about seven o'clock, are attended with a sense of exhaustion and faintness, a cold and pallid state of the skin; and continue about three hours.

Her appetite is deficient, food remains a long time undigested in the stomach, and what she has eaten at

dinner is often regurgitated during the paroxysm, along with oily eructations. She has a difficulty in moving the left arm. Pains frequently occur in different parts of the abdominal parietes. Pain is felt in the hypogastrium at the time of making water, and a sense of difficulty in passing the urine, which is turbid, high coloured, and scanty. Occasional sensation of globus, particularly during inspiration. Palpitations occur two or three times a day; and she labours under a constant feeling of muscular debility. Bowels generally confined. In other respects her health is good. She has been nine months suffering in a greater or less degree.

There is tenderness on pressing the first and second cervical, and the six lower dorsal vertebræ.

June 30th. Twelve leeches to be applied over the lower dorsal portion of the spine, and an aloetic pill to be taken at bed-time occasionally.

July 2d. Feels much better, had less oppression last night than for several weeks, and less pain under the sternum. The pains in the head returned in the usual manner, but in a slighter degree. She can put the arm behind her with greater facility; sense of debility diminished; food has been digested better; no pains in the abdomen; palpitations less violent. A blister is now recommended, but some domestic arrangements prevent this part of the treatment being carried into effect at present.

9th, 10 p. m. For two days after the last report she was much better. On the 5th she had a little return of the complaint in the evening, and it has gradually increased until the 8th, when the attack was very severe, and the present evening has been still more violent. This last attack was attended with a sense of

suffocation, palpitations, and shortness of breathing, the inspirations becoming shorter and shorter until she was at last obliged to take deep and laborious sighs. The same parts of the spine are tender. The paroxysm has now subsided, but she remains very languid. The arm is numb and almost powerless; there is considerable sense of weight at the stomach.

Leeches to be applied to the cervical, and a blister to the dorsal vertebræ; a draught containing two minims of prussic acid to be taken three times a day; recumbency to be observed for a few days.

12th. She has had no attack since the 9th, and the pain at the stomach and numbness of the arm are much diminished. Food, consisting of milk, with farrinaceous articles, is easily digested. Bowels act regularly.

15th. Continues improving; has no unpleasant symptoms, except weakness of the left arm. The blister being healed, she is directed to apply the oil of turpentine to the spine every night.

She continued well until the end of December, when she again became subject to the same kinds of attack, and in June, 1829, she was similarly affected. The same plan of treatment was successfully adopted on both occasions, with the omission of the prussic acid. She was under treatment about a fortnight each time, and during the interval remained quite well.

Case XXII.

Angina, Neuralgia of Left Arm and Breast, Flatulence, &c.

August 18th, 1828. Mrs. R., æt. 56, whilst on a visit in Leeds, consulted me respecting a variety of nervous symptoms, which, for a great length of time, had given her considerable anxiety. On inquiry, I found that she had tightness across the epigastrium, flatulence, palpitations, and general muscular debility. There was tenderness on pressing most of the cervical, and some of the lower dorsal vertebræ. Leeches were applied to the spine, and on the following night a blister, which produced great relief, and in a few days she was considered convalescent, being better than she had been for many months. On the evening of the 25th, she was suddenly seized with coldness, inexpressible sense of suffocation, tightness and oppression at the chest, a feeling as if she were immediately about to die, pain striking down the left arm to the elbow, and down from the neck to the left breast. Some relief was obtained after the discharge of great quantities of air from the stomach. Stimulants were administered, a sinapism applied to the spine, and warmth, externally, to the extremities. As soon as the heat of the body was restored, she felt comparatively well. On the next day, tenderness was felt in the same parts of the spine as before, and the symptoms mentioned at the commencement of this account were perceived, though in a moderate degree. As she was obliged to return home, she was directed to apply a blister alternately to the cervical and lower dorsal vertebræ, at intervals of ten days or a fortnight, for a few

months. She has, for some years, been subject to occasional paroxysms of this kind. I have not heard of her since she left.

This case is of importance, as it shews that the occurrence of congestion, in an individual labouring under or barely recovered from irritation of the spinal marrow and ganglia, produces that train of symptoms which has been designated angina pectoris.

COLICA PICTONUM.

This is a disease which I have had very few opportunities of observing, but from the numerous descriptions that have been given of it, the symptoms appear attributable to neuralgia of several nerves, both of the spinal and of the sympathetic systems. In two instances which I have seen, I well remember that after cupping in the loins had been employed, on account of severe aching pain in the lumbar portion of the spine, the abdominal symptoms and pains in the limbs were very strikingly alleviated.

Various continental writers have considered this disease to be a real inflammation of the spinal chord; and, on this account, Astruc has proposed to treat it by bloodletting.

Andral,* after extensive opportunities for observation, concludes, that the alimentary canal is not the sole organ affected in those individuals who are suffering from the absorption of lead, but that the nervous system is often influenced in a remarkable manner. In speaking of this form of colic, he says, if we attend to the different nervous affections with which it is complicated, and which may even exist without it, we shall be led to think

* Clinique Médicale, &c., par G. Andral, fils. 4me. partie, p. 488.

that the symptoms which are exhibited in the alimentary canal, result from a disorder of that portion of the nervous system, which presides over the digestive organs. The lead colic is, in his opinion, a disease of the nervous system, in which the spinal marrow and the plexus of the great sympathetic appear particularly implicated. The constipation appears to depend either upon the loss of muscular power of the intestines, or the suspension of the secretion of mucus in the alimentary tube.

CONCLUSION.

In concluding this short treatise, I have to apologize for its numerous imperfections, of which no one can be more fully sensible than myself. Conscious, however, of the defects of my undertaking, yet firmly convinced of the practical importance of the pathological views which have been adopted, I have thought it a duty to submit to the profession the result of my observations.

I have again to request that I may not be thought desirous of advocating a theory of uniform infallibility, or a practice invariably successful. Disappointments will occasionally occur, and failure must sometimes be encountered. As an instance of disappointment the following case may be related. I was lately consulted about a young lady who suffered from a fixed pain in the right side of the abdomen, palpitations, and pains in the head. For many years she had been subject to pain in the side, which had always been regarded as hepatitis, though without there being any symptoms strictly characteristic of that disease. On examination, I found that the pain was seated in the abdominal muscles, and occupied about three fingers' breadth between the cartilages of the right ribs and the crista of the ilium; it sometimes varied in intensity, but the exacerbations did

not observe any regularity in their recurrence. The seventh and eighth dorsal vertebræ were extremely tender, and remained painful for some hours after pressure had been made, and nearly the whole of the cervical vertebræ were also tender. This lady remained under my care between five and six weeks; leeches were applied to the affected parts of the spine, dry cupping, and three blisters. The pains in the head and palpitations were relieved almost from the commencement, the appetite improved, but the pain in the side, although a little diminished in violence, continued troublesome, and occasionally returned with considerable severity. It is right to state, that once, for the space of three days, she was entirely free from pain, and this occurred immediately after the application of one of the blisters to the lower dorsal vertebræ. On the return of the pain she was desirous of trying the effect of a blister to the side, but it produced no alleviation whatever. A removal into the country, and perseverance in the use of applications to the spine were now recommended, but as the pain in the side had not yet been completely relieved, her friends became impatient, and were induced to place her under the care of an empiric. Such disappointments we must be prepared to expect, but their occurrence is so rare, as not to invalidate the general principle.

When these diseases have proved unusually obstinate, or the treatment has entirely failed, I have generally found that they have been complicated with others. The bones or intervertebral cartilages are in some instances affected, and the nervous structures are thereby disposed to repeated relapse. The heart may be the seat of incipient organic changes, which seems to keep up irritation in the nervous masses from which

its nerves are derived; or the stomach may have undergone some alteration of structure, which, by its continued irritation, may keep up a disordered state of the ganglia, and thereby produce obstinate neuralgic symptoms.

In some irritable constitutions a feverish state is occasionally produced by the blisters, and the disease of the nerves will, during the continuance of fever, often be a little aggravated, but, on its subsidence, the nervous affections generally abate. In these cases a sufficient interval should be allowed for recovery from the effects of the blister, before we have recourse to a repetition of it, and probably it would be more judicious in the future treatment to give preference to leeches or cupping, and such irritating applications as act locally, without producing much feverish excitement.

It sometimes occurs that after the violence of the symptoms has been subdued by the treatment directed to the spine, the neuralgic affections, in a mitigated form, assume an intermittent character, and a languid state of health continues. Such cases are benefitted by tonic medicines, and more particularly by change of air.

THE END.

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